# ELECTRICAL WEST

March 1949
25 Cents

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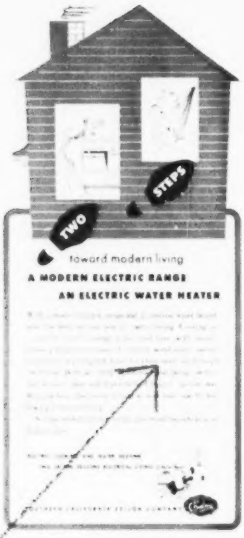
Appliances, Page 82

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.



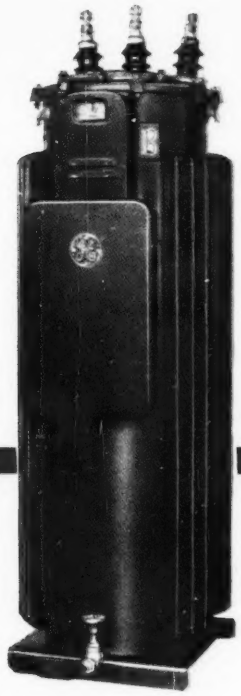

# RECOMMENDED READING!

In modern homes, Edison advertisements are high up on the regular reading list. Alert homemakers follow them as guides to the latest electrical developments in living comfort and housekeeping convenience.

We recommend Edison advertisements to appliance dealers, too. Because they are always prepared with an eye on available appliances, they will help you time your own sales efforts for the best results.

This cooperative program has been selling electrical appliances in Southern and Central California for more than fifty years. Edison tells them — and the dealer sells them.

Edison SOUTHERN CALIFORNIA EDISON COMPANY



# The Regulator *you* asked for!

**We took stock!** We made a careful digest of all comments and suggestions that we had received from you in the electric utility industry as to what you wanted in single-phase induction-voltage regulators.

**The result:** a new Type IRS Regulator the regulator you asked for.

It still has the high accuracy, the narrow band width, and the immediate response that you praised in G-E regulators. It will continue to require practically no maintenance—the characteristic that has made the G-E induction voltage regulator one of the most dependable and satisfactory equipments on central-station lines.

*And now it is . . .*

## EASIER TO INSTALL!

- The new rectangular base provides greater stability, gives ample clearance for jacking and allows you to move the regulator in any direction on rollers.
- The clamp-type bushing terminals accommodate a wider range of cable sizes.
- New copper-faced ground pad has bolts spaced for NEMA terminals.

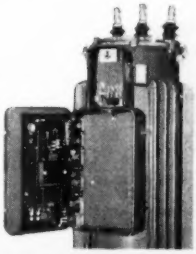
## EASIER TO ADJUST!

- Adjustment for holding effect in voltage-regulating relay is now made with a single-dial rheostat.
- Manual control now operates directly in the motor circuit.
- Terminals for current testing, as well as potential testing, are now conveniently located on front of panel.

Our new booklet GEA-2985 contains a complete description of this new regulator. If you have not received your copy, write your nearest G-E district office or *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

**You asked for a place to put testing instrument.** The new regulator has a shelf built into the control cabinet door which locks the door open, keeps it from swinging, and at the same time provides a handy place for portable instruments. Note the good appearance of the semi-flush control panel.

**You asked for more accessibility.** In the new regulator, the entire control panel swings open, exposing all the wiring and connections making all control components readily accessible for maintenance and inspection.



GENERAL ELECTRIC

**MARCH 1949**

**SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.**
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents copyright, Sixty-second year of publication

# ELECTRICAL WEST

James H. McGraw (1860-1948), Founder
James H. McGraw, Jr., Chairman of the Board — George C. Tenney, President and Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
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## APRIL'S SHOWER

Truly showering down valuable and interesting material upon you will be the April number. As last year, it will be in two sections, the regular magazine and the Directory of Manufacturers and their Western representatives and distributors, plus the appliance repair parts and service station directory. This directory will be something to keep and to refer to all year 'round. In the issue itself are many specials. An excellent talk recently given dealers on the present appliance situation leads off. Long-range distribution system planning to meet load growth in Sacramento is interesting to engineers. PT & T's plans for microwave beam transmission and coaxial cable coverage of the West to provide channels for television and chain broadcasting is of vital importance in many ways. The novel lighting and wiring methods used in Macy's new San Francisco store will be covered in pictures and story. Lighting ideas, power factor and commercial heating data sheets round out lighting and wiring pages. In sales the Edison Co. "Sunshine Package" lamp campaign, what intrastore television involves, Electrical Living Institutes, and some unique dealer stores will be offered. The IES conferences will head association news of this month. It will be a bargain package issue.

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Cover photo: One of the appliance exhibits in the recent spring Market at Western Merchandise Mart in San Francisco.

ADVERTISING REPRSENTATIVES

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**VOL. 102 NO. 3**

New 50 Kva (left, back) and 37½ Kva Round-Wound transformers. Round coils offer more cooling surface; oil ducts between core and coil and built into coils eliminate hot spots and give exceptional short time overload capacity before excessive temperatures are reached. White dotted line in core-coil assembly (lower left) indicates shape of the wound silicon-steel strip core which reduces weight and improves performance characteristics.

ROUND COILS WOUND CORE

# L-M ROUND-WOUND CONSTRUCTION MAKES 37½ and 50 KVA TRANSFORMERS

# 33⅓% lighter-

## with improved short-time overload characteristics

L-M's famous Round-Wound construction is now available in 37½ and 50 Kva sizes. These new sizes have round coils wound directly onto the wound core. They offer all these advantages:

**Weight reduced 33⅓%** — with improved short time overload characteristics because of better cooling.

**Balanced Performance** — lower exciting current, better ratio of losses, improved regulation, lower impedance.

**Longer service life** through higher average impulse strength, and greater short circuit strength inherent in the round cross section coil.

New round tanks with all the latest L-M improvements in weather-resistant paint, moisture-tight covers and bushings, and L-M accessories.

*Write for this Bulletin*

Illustrates details of Round-Wound construction, describes L-M research and test facilities, and features and performance of L-M Distribution Transformers. Write Transformer Division, Line Material Company, Zanesville, Ohio.

**L-M Round-Wound Transformers are made in 1½ to 50 Kva, in all distribution class voltages including 14,400 volts, and meet EEI and NEMA standards.**

# LINE MATERIAL TRANSFORMERS

LM

*L-M DISTRIBUTION EQUIPMENT INCLUDES:* Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

# 5 of the 8 LARGEST Utilities Have Already

The Positect is a "3-in-1" protective unit of unique and superior character. As a distribution cutout it tops the list in interrupting capacity and dependability. But the new Positect is more than a cutout, since it embodies safety and convenience features of great importance, not heretofore expected of any cutout.—And it provides these features at a cost so low that it permits widespread use—even standardization for the entire system.

Here enumerated are the features that make the Positect outstanding:

(1) SHORT CIRCUIT INTERRUPTING ABILITY

- Up to 12,000 RMS amperes—the highest of any cutout.
- Invulnerability to corrosion, vibration, and interference from ice, bugs or birds; adequate mechanical strength and high flashover values exceeding NEMA standards by up to 60%—all of which tend to assure highest interrupting ability at all times.

(2) SWITCHING CONVENIENCE

- Insertion or withdrawal of handle-and-tube is all that is necessary for switching distribution transformer load or magnetizing currents, or charging currents of small capacitor banks,

(3) SAFETY CHARACTERISTICS

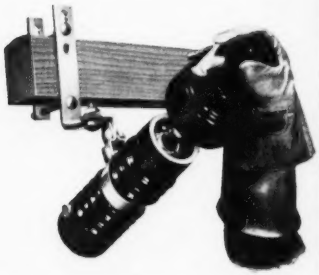
- Removes the hazard attending the inadvertent opening of conventional cutouts under load.
- Discharge is away from the man if accidentally closed in on short circuit.
- All live parts are unusually well enclosed.
- High interrupting ability gives adequate margin of safety against cutout "blowing up".

These features make the Positect particularly desirable for application on metropolitan distribution systems where concentratian of power is a general condition; for the areas of any system where power is concentrated; and for the growing areas where ultimately load concentration will bring about excessively high short circuit currents.

The fact that 5 of the 8 largest electric utilities have already adopted the Positect may be significant that it is a product meriting your most serious consideration. Ask for Catalog Section 520 telling more of the story.

S&C ELECTRIC

# Adopted the NEW POSITECT



## TYPICAL PERFORMANCE VALUES

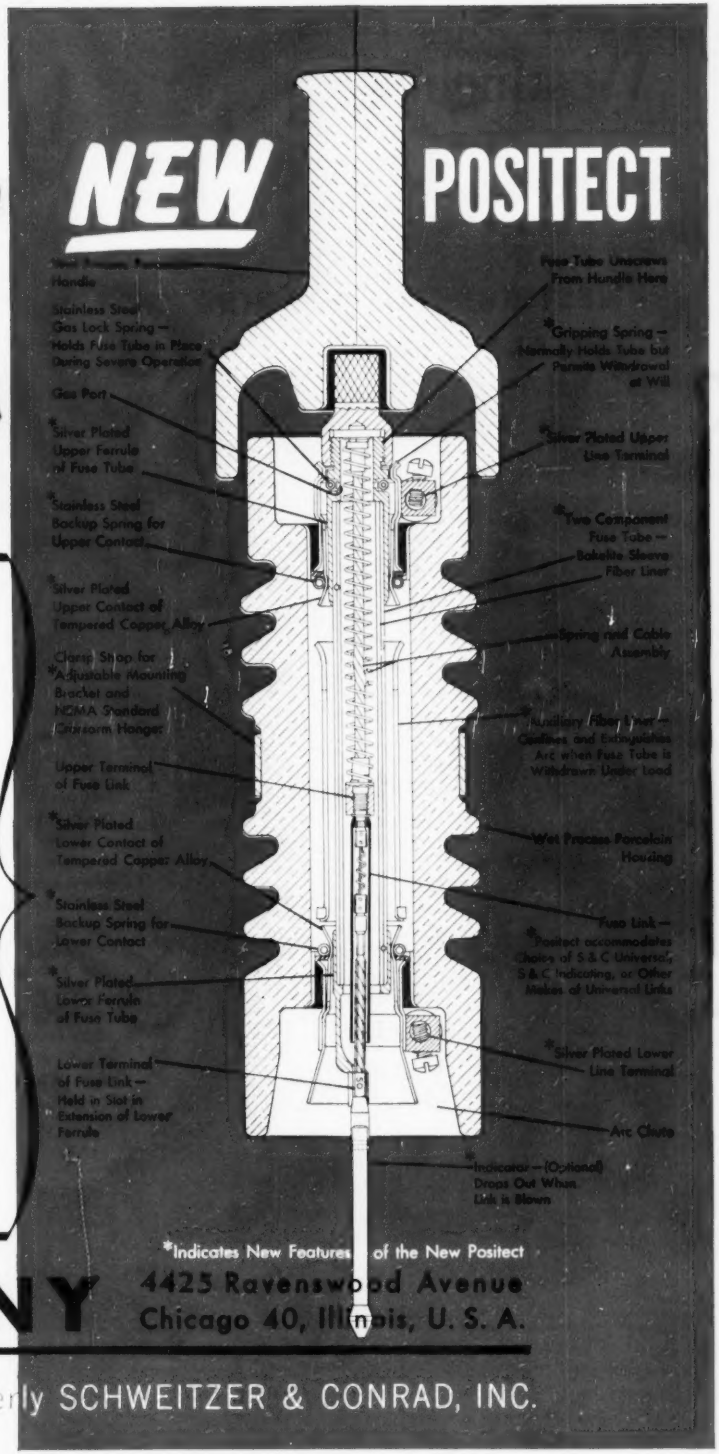
*Short Circuit Interrupting Capacity*
of 10,000 and 12,000 amperes for the 50-ampere and 100-ampere Positect respectively, on 2400-, 2400/4160y- and 4800-volt systems.

*Load and Magnetizing Current Interrupting Ability*
adequate for switching: 75 kva single-phase distribution transformers on 2400- and 2400/4160y-volt systems, with the 50-ampere Positect; 100 kva single-phase, with the 100-ampere Positect; also 3-phase transformers of corresponding load current values.

*Charging Current Interrupting Ability*
adequate for switching 3-phase capacitor banks up to 135 kvar on 2400-volt systems, and 225 kvar on 2400/4160y-volt systems, with 50-ampere Positect; with the 100-ampere Positect, 225 kvar on 2400-volt systems.

## RATINGS

5000 Volts, 50 Amperes
5000 Volts, 100 Amperes
7500 Volts, 50 Amperes


Handle
Stainless Steel Gas Lock Spring — Holds Fuse Tube in Place During Severe Operation
Gas Port
*Silver Plated Upper Ferrule of Fuse Tube
*Stainless Steel Backup Spring for Upper Contact
*Silver Plated Upper Contact of Tempered Copper Alloy
Clamp Stop for *Adjustable Mounting Bracket and NEMA Standard Crossarm Hanger
Upper Terminal of Fuse Link
*Silver Plated Lower Contact of Tempered Copper Alloy
*Stainless Steel Backup Spring for Lower Contact
*Silver Plated Lower Ferrule of Fuse Tube
Lower Terminal of Fuse Link — Held in Slot in Extension of Lower Ferrule
Fuse Tube Unscrews From Handle Here
*Gripping Spring — Normally Holds Tube but Permits Withdrawal at Will
*Silver Plated Upper Line Terminal
*Two Component Fuse Tube — Bakelite Sleeve Fiber Liner
Spring and Cable Assembly
Auxiliary Fiber Liner — Quenches and Extinguishes Arc when Fuse Tube is Withdrawn Under Load
Wet Process Porcelain Housing
Fuse Link — *Positect accommodates Choice of S & C Universal, S & C Indicating, or Other Makes of Universal Links
*Silver Plated Lower Line Terminal
Arc Chute
*Indicator — (Optional) Drops Out When Link is Blown

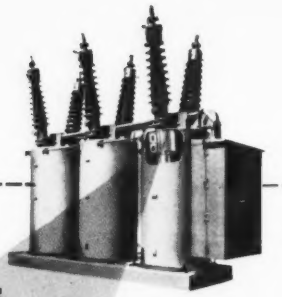
*Indicates New Features of the New Positect

# COMPANY

4425 Ravenswood Avenue
Chicago 40, Illinois, U. S. A.

Formerly SCHWEITZER & CONRAD, INC.

YOU CAN BE **SURE**.. IF IT'S
Westinghouse



**WESTINGHOUSE BUSHING-TYPE LINEAR COUPLER TRANSFORMERS**

# SATURATION PROOF

**for faster, more reliable bus differential relaying**

Get fast, reliable relay protection "built in" your circuit breakers with Westinghouse linear coupler transformers. Installed in the same way as bushing-type current transformers, they provide straight-line characteristics, since there is no iron in the magnetic circuit. Accurate relay settings and performance may be calculated readily by means of a few simple equations.

Linear coupler transformers give you complete reliability at low cost . . . with no additional space requirements. They are applicable to all Westinghouse outdoor oil circuit breakers.

Bushing (Type BLC) and separately mounted (Type LC) linear coupler transformers may be used in conjunction with linear coupler relays for the protection of a single bus to reliably differentiate between internal and external faults.

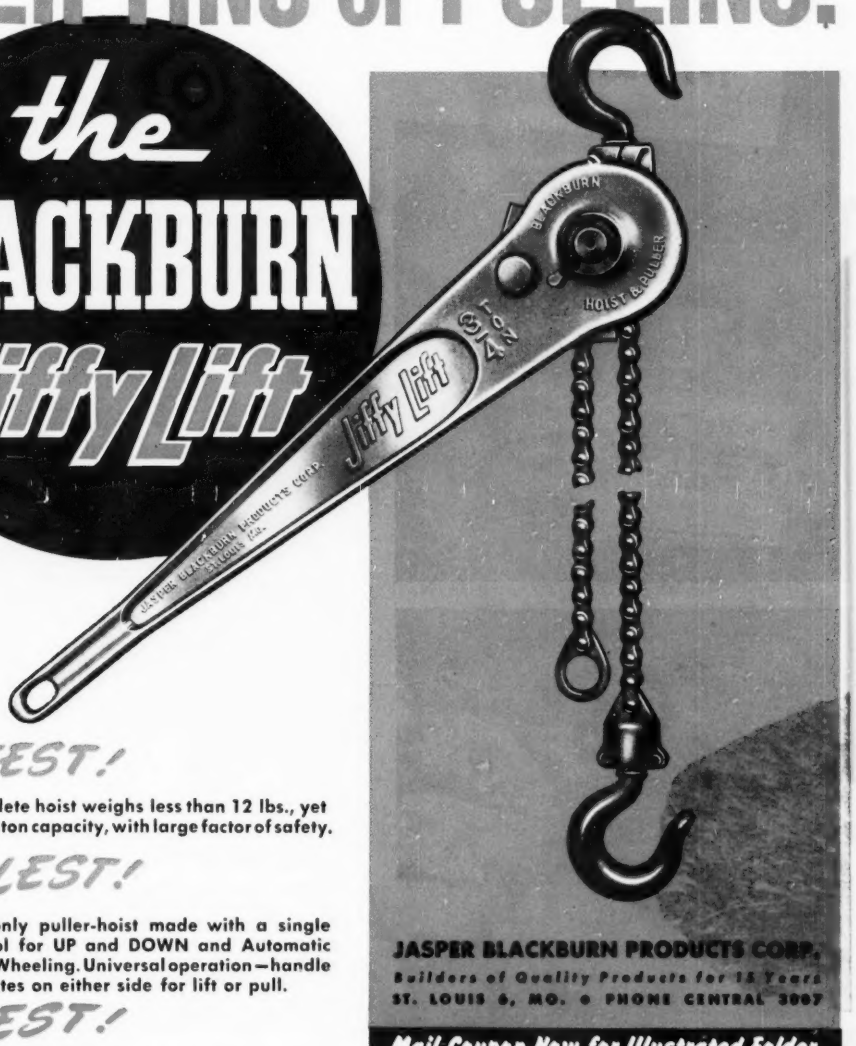
For complete information on linear coupler transformers, call your nearby Westinghouse office. Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-60696

*For complete information on Westinghouse power circuit breakers ask for B-3686 (up to 69 kv) or B-4012 (115 kv and above).*

Westinghouse
POWER CIRCUIT BREAKERS
FOR *ANY* SYSTEM

# HERE'S THE HANDIEST THING YET for LIFTING or PULLING!

## the BLACKBURN Jiffy Lift




### LIGHTEST!

**Complete hoist weighs less than 12 lbs., yet has ¾ ton capacity, with large factor of safety.**

### SIMPLEST!

**The only puller-hoist made with a single control for UP and DOWN and Automatic Free-Wheeling. Universal operation—handle operates on either side for lift or pull.**

### FASTEST!

**Quick action, Ratchet-type. Easy to rig—quick to use. Operator can also vary lift per stroke. High efficiency means less fatigue.**

### JIFFY LIFT IS IDEAL FOR:

Tightening Guy Wires . . . Pulling Cables and Messenger Wires . . . Skidding or Lifting Heavy Equipment . . . Installing and Repairing Machinery . . . Pulling Motors, Wheels, etc. . . . Lifting in Close Quarters . . . General Maintenance . . . In short, for any Lift or Pull.

*ORDER FROM YOUR JOBBER — MONEY-BACK GUARANTEE*

**JASPER BLACKBURN PRODUCTS CORP.**
*Builders of Quality Products for 15 Years*
**ST. LOUIS 6, MO. • PHONE CENTRAL 3007**

***Mail Coupon Now for Illustrated Folder***

**JASPER BLACKBURN PRODUCTS CORP.**
**First, Madison & Clinton Sts., St. Louis 6, Mo.**

Send me, without obligation, Illustrated Circular describing the Blackburn Jiffy Lift Hoist & Puller, prices on same, and name of nearest jobber.

*Your Name & Title* _____

*Firm Name* _____

*Address* _____ E We

# Where rubber cable must fight OIL-WATER-SUN-HEAT-OZONE-ABRASION

**CONSTANT FLEXING**

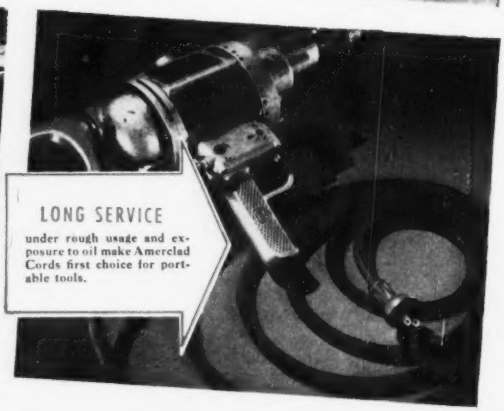
plays hob with some cables but Amerclad is built to give unfailing service under conditions like this.

**LIGHTNESS,**

flexibility and high resistance to heat and abrasion are combined in Amerclad Welding Cable.

**SEVERE ABRASION,**

immersion in acid mine water and contact with oil and grease do not damage Amerclad Portable Machine Cables.



**LONG SERVICE**

under rough usage and exposure to oil make Amerclad Cords first choice for portable tools.

# —YOU NEED U·S·S AMERCLAD

IF you make or use electrical equipment that operates under any of the above conditions, you should consider U·S·S Amerclad Rubber Covered Cords and Cables.

**Oil-resisting** Amerclad Cables are made with a Neoprene cover which doesn't swell when exposed to oil or grease.

**Water** can't penetrate the live rubber covers. That's why so many Amerclad Cables are used on dredges, mining machines, trolley buses and other portable equipment.

**Sunshine** won't crack the specially compounded Amerclad covers so that this cable can be used outdoors or inside.

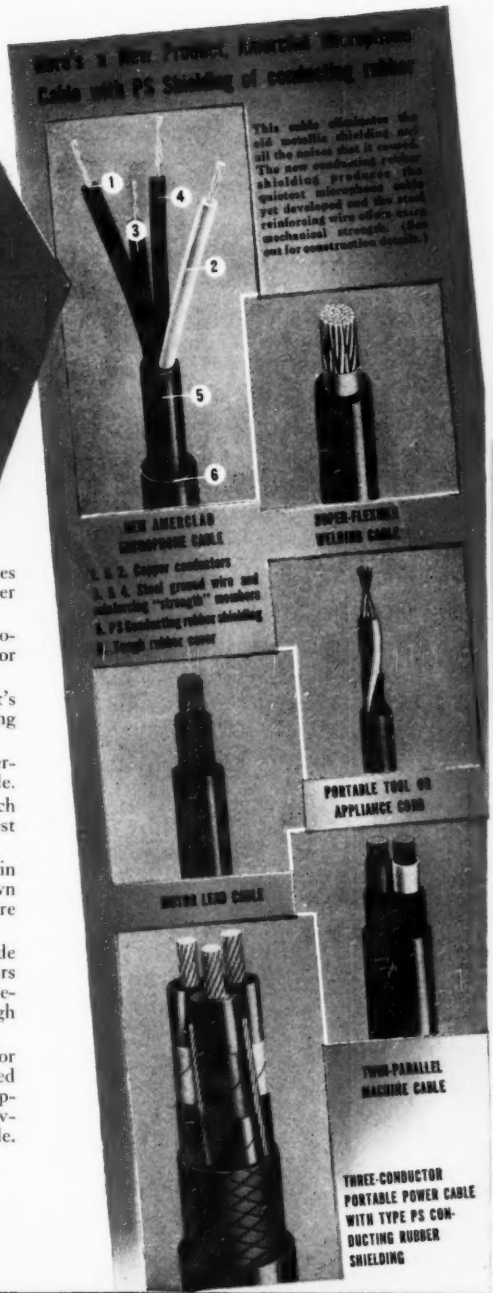
**Heat and flame resistance** of Amerclad Cables is such that they easily pass the State of Pennsylvania flame test for mining cables.

**Ozone** troubles at higher voltages are prevented in Amerclad Cables by use of conducting rubber tape known as PS Shielding, a development of American Steel and Wire Company engineers.

**Abrasion Resistance** of Amerclad Cables has made them famous throughout industry. No other rubber covers surpass Amerclad in toughness — they are made of "tire-tread" rubber and can be dragged over sharp rock or rough floors without damage.

**Applications.** Amerclad cables are especially built for portable machinery and tools of all kinds. They are used for motor and generator leads, machine tools, welders, appliances, mining machinery—wherever a sturdy rubber covered cable is needed for long life and freedom from trouble.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK


Here's a New Product, Amerclad Microphone Cable with PS Shielding of conducting rubber
This cable eliminates the old metallic shielding and all the noises that it caused. The new conducting rubber shielding produces the quietest microphone cable yet developed and the steel reinforcing wire offers extra mechanical strength. (See cut for construction details.)
1
2
3
4
5
6
NEW AMERCLAD MICROPHONE CABLE
1, 2, 3. Copper conductors
4, 5, 6. Steel ground wire and reinforcing "strength" members
7. PS Conducting rubber shielding
8. Tough rubber cover
SUPER-FLEXIBLE WELDING CABLE
PORTABLE TOOL OR APPLIANCE CORD
MOTOR LEAD CABLE
TWIN-PARALLEL MACHINE CABLE
THREE-CONDUCTOR PORTABLE POWER CABLE WITH TYPE PS CONDUCTING RUBBER SHIELDING

USS AMERCLAD CABLES

UNITED STATES STEEL

The a-c secondary network system is recognized as *the* lowest-cost system for providing heavy load areas with the highest-quality service—both in voltage and in continuity. It is normally the most economical high-quality service system for business sections of cities having underground distribution, and of the order of 50,000 or more in population—and may often pay its way in smaller towns as well.

*But—to realize the full savings possible with networks, you must use standardized network equipment. For example:*

**YOU SAVE ON INSTALLATION when you specify**

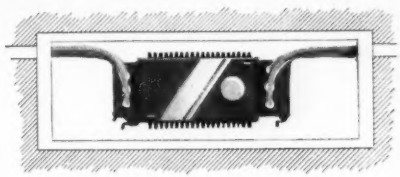
# STANDARDIZED NETWORK EQUIPMENT

**NARROWER VAULTS** G-E standardized network equipments are designed for vaults with widths of only 4½ feet—or less. Such vaults can almost always be built between building line and curb—the best location from the standpoint of real estate, construction, and servicing. Such narrow vaults reduce appreciably the problem of roof-slab construction.

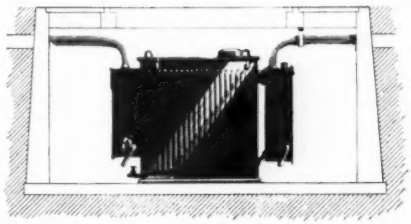
**REASON:** G-E standardized network equipments require servicing only from the two ends. The network protector is located on the low-voltage end—can be slid out on rails from its housing for ready inspection or adjustment. All transformer accessories, as well as the high-voltage switch, are located at the high-voltage end—liquid-level gages, thermometer, pressure test valves, tap changer, drain valves, sampling valves and filter press valves can all be inspected or operated from this end.

**SHALLOWER VAULTS** With G-E standardized network equipments, vaults can be as much as one or two feet shallower—saving substantially in excavating and construction costs. Vault drainage is also simplified though either the vault type or the subway type transformer can be completely submerged without damage or interruption of service.

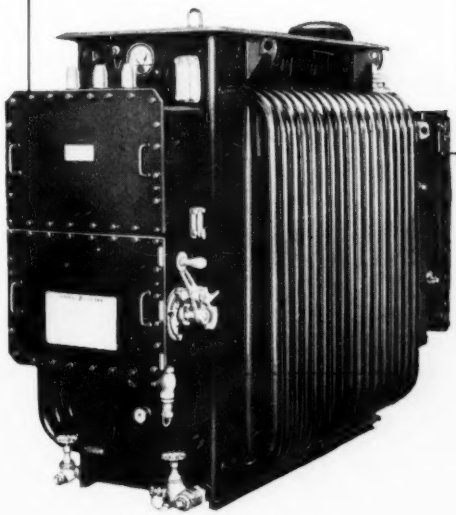
**REASON:** With G-E standardized network equipments, both high- and low-voltage cable terminals are well below the top of the transformer. Even in these shallow vaults there is room for large-radius bends of cables.



**With manhole openings at both ends, vault need be only 14' long, 4½' wide for 500-kva transformers.**



**A clear depth of 7' below roof slab will provide sufficient room for maintenance and inspection.**



**PLUS**

**FASTER DELIVERY** G-E standardized network transformers and protectors can be supplied on shorter delivery.

**LOWER PRICE** G-E standardized network units are appreciably lower in price than non-standard designs.

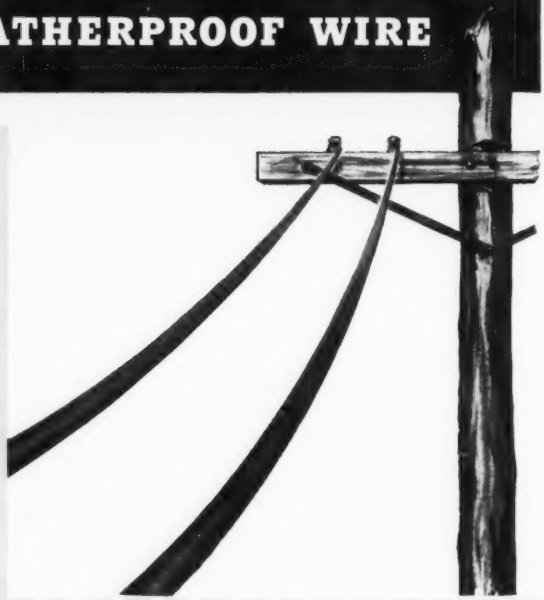
**LESS MAINTENANCE** G-E standardized network equipments incorporate all maintenance-saving developments which the industry recognizes as desirable—gaskets eliminated by welding cover and switch box to transformer, accessories grouped for maximum convenience, all bushings externally removable without opening the main transformer tank, dust-tight relays which can be easily removed for checking, and then replaced.

An inquiry to your G-E Representative or a letter to *Apparatus Department, General Electric Company, Schenectady 5, N. Y.,* will bring you information on standardized network equipment—and just what should be specified to secure the savings which this equipment makes possible. Bulletin GEA-5024 describes standardized network transformers; GEA-2017 describes G-E network protectors.

GENERAL ELECTRIC

# it's new RoLene Polyethylene Covered WEATHERPROOF WIRE

- *LONGER LIFE*
- *MOISTURE RESISTANT*
- *LIGHTER WEIGHT*
- *SMALLER DIAMETER*
- *ABRASION RESISTANT*
- *RESISTANT TO SUNLIGHT AND WEATHERING*
- *SIMPLE TO HANDLE AND INSTALL*



Summed up for you, above, are the outstanding features of RoLene, Rome's new polyethylene covered Weatherproof wire. There are no braids to rot and festoon. Because of reduced wall thickness . . . 3/64" on sizes 12 AWG to 4 AWG . . . and the lower specific gravity of polyethylene, overall weights and diameters of RoLene are less than conventional Weatherproof. This means longer spans of RoLene for the same loading conditions . . . longer life . . . neater appearance . . . easier handling.

Rome RoLene Weatherproof wire is manufactured in sizes 12 AWG through 4 AWG with solid conductors, and in sizes 2 AWG and 1 AWG with stranded conductors. Conductors can be soft, medium hard drawn, or hard drawn as specified.

**FOR CONSTRUCTION DETAILS WRITE FOR SPECIFICATION WP-3.**

FROM BAR TO FINISHED WIRE

## ROME CABLE CORPORATION

ROME · NEW YORK

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# These FOUR FACTS ...add up to Closer Regulation at Lower Cost with Allis-Chalmers 5/8% Step DFR* Regulators!

**FACT 1.** **Maintain voltage within ± ¾ volt.** *Feather Touch Control* and *Voltage Integrator* make possible simpler, closer control . . . *Feather Touch Control* because it accurately follows line fluctuations without damping effect; *Voltage Integrator* because it sums up and balances out voltage fluctuations of short duration.

**FACT 2.** **Require only ⅓ the exciting current** of other types! Low exciting current of Allis-Chalmers regulators releases system capacity for useful loads . . . can be evaluated in savings up to 5% of purchase price. (Specific information available on this important point.)

**FACT 3.** **Up to 200% base current capacity** in as many as five intermediate steps with exclusive *Vari-Amp* feature. Simple 30-second adjustment adapts standard DFR regulator to increased load current of growing power demand (with corresponding adjustment in regulation range) . . . *without* need for by-passing or removing regulator from line.

**FACT 4.** **Proved low maintenance.** The *Quick-Break* tap changing mechanism and long-life contacts have withstood *hundreds of thousands* of tap changes under actual service conditions! These outstanding performance records are due to (1) the balanced spring action of the tap changing mechanism, (2) the small KVA interrupted with 5/8% steps, and (3) use of *Elkonite* RS-1045 contacts.

**Many utilities have boosted load capacity of their feeders, increased revenue, and improved customer good will by closely controlling line voltages with Allis-Chalmers ⅝ % step regulators. Have your nearby A-C sales representative call and discuss these regulators in terms of specific advantages to your system. Or write for bulletins 01B6065A and 01B6056B.**

A 2649

**ALLIS-CHALMERS, 939A SO. 70 ST.**
**MILWAUKEE, WIS.**

**DFR — station type single phase regulator.*
*AFR — for 3 phase regulation.*

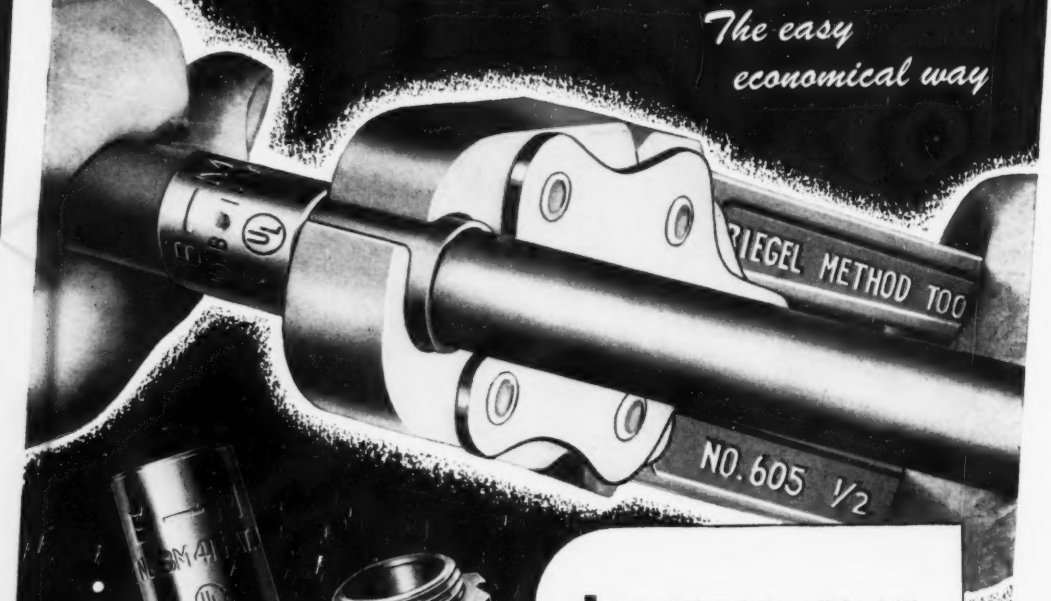
*Vari-Amp* is an Allis-Chalmers Trademark

# ALLIS-CHALMERS

***Originators of 5/8% Step Regulation***

# *Get* CORRECT CONDUIT CONNECTIONS

*The easy economical way*



Cross Section Showing Indentations

• NEATER • STRONGER • FASTER • APPROVED

All B-M Fittings Carry the Underwriter's Seal of Approval and Canadian Standards Ass'n Approval No. 9296

Select the best, insist on Briegel All Steel Fittings, the original approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections, the correct connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers—more profits from each job.

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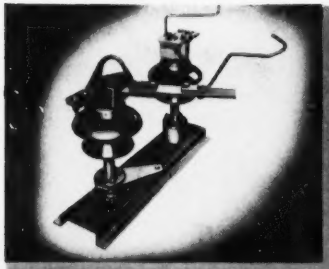
The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; Kondu Mfg. Co., Ltd., Preston, Ont.

**BRIEGEL METHOD TOOL CO.**

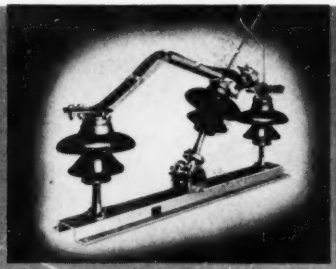
GALVA, • ILLINOIS

YOU CAN BE **SURE**.. IF IT'S

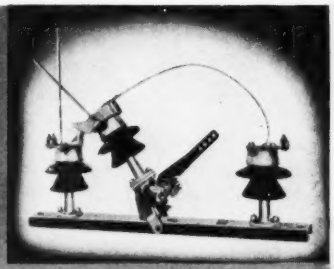
# Westinghouse



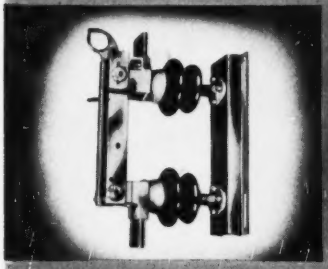
Type RL—Outdoor, Group-Operated
7.5 to 161-kv, 400 to 1,200 amperes



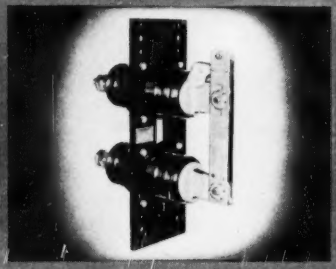
Type RW—Outdoor, Group-Operated
7.5 to 34.5-kv, 400 to 1,200 amperes



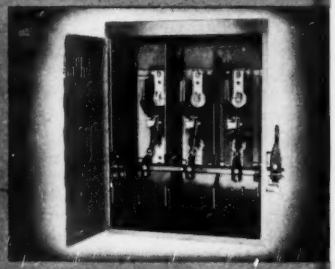
Type RWR—Outdoor, Group-Operated
7.5 to 15-kv, 200 amperes



Type HCO—Outdoor, Hookstick-Operated
7.5 to 161-kv, 400 to 2,000 amperes



Type HC—Indoor, Hookstick and Group-Operated
2.5 to 34-kv BIL, 200 to 6,000 amperes



Type HB—Indoor, Group-Operated
2.5 to 15H-kv BIL

Type V—Outdoor, Group-Operated
7.5 to 230-kv, 400 to 4,000 amperes.
The leader of the field with only three moving parts, no shunts, and bearings lubricated for life.

## The complete switch family . . .

*Customer Built*-

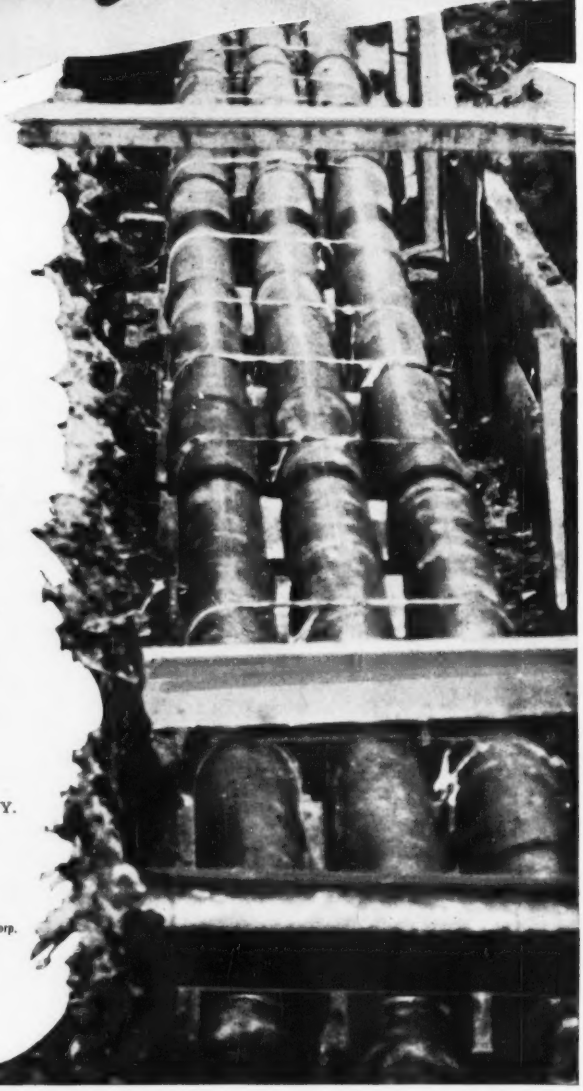
Look closely at these disconnect switches. They *all* contain features that were suggested by you—the switch user. Whatever your switch requirements or preferences may be, a Westinghouse disconnect switch will fill the bill dependably, economically and with low maintenance. For complete information, get in touch with your nearby Westinghouse office or distributor. Ask for B-4242. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-60690

**Westinghouse**

DISCONNECTING SWITCHES
FOR *ANY* SYSTEM

WESTINGHOUSE

# A Report from The Underground...



The "underground" is the modern distribution system upon which every Utility Company depends for reliable and constant service.

These valuable cables must have protection—

1. Protection from Cable Sheath Abrasion.
2. Protection from Pulling Tensions.
3. Protection from Corrosion.
4. Protection with Cable Movement.

For over 50 years the Electrical Industry has used Orangeburg Fibre Conduit as the ideal protection for the cables performing such priceless service.

Now this is the news from the "underground". On inspection—after 50 years underground —ORANGEBURG CONDUIT reveals its original high quality . . . strong, tough, lightweight, easy to handle, transport, install . . . a product of low initial cost and low maintenance . . . a product that resists permanently corrosive ground waters and chemical wastes.

The informative ORANGEBURG Catalog No. 49 is yours for the asking. Write today!

Technical Bulletin A.C. 48 is also available. It explains the use of 5° Angle Couplings with short lengths in place of special long radius bends.

Orangeburg Manufacturing Co., Inc., Orangeburg, N. Y.

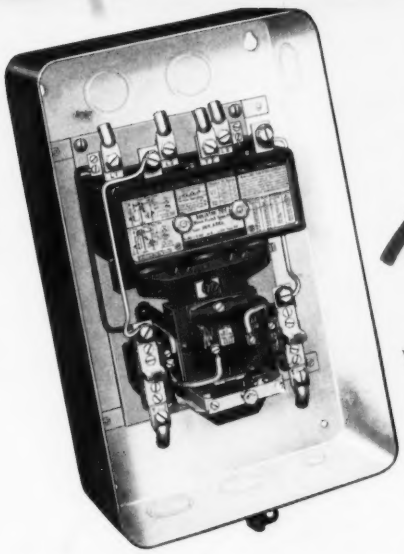
**ORANGEBURG**
**FIBRE CONDUIT**

Graybar Electric Co., Inc. • Distributors • General Electric Supply Corp.

ORANGEBURG

**ORANGEBURG STANDARD**
For installation with concrete encasement.

# The Motor Starter for THOUSANDS of APPLICATIONS

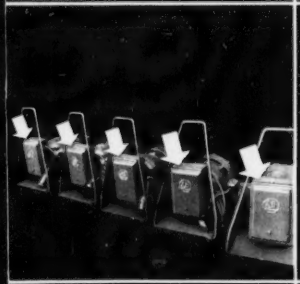


## . . . Good for Millions of Trouble-Free Operations

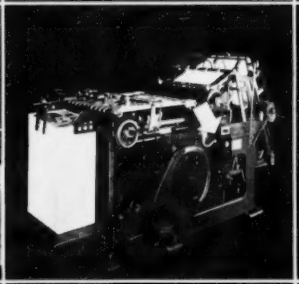
**VERSATILE** . . . that one word best describes the wide utility of the Allen-Bradley Bulletin 709 Solenoid Starter. Most motor installations need across-the-line starting . . . push-button control . . . and dependable overload protection. These features . . . and many more . . . are provided by all Bulletin 709 Solenoid Starters.

**TROUBLE-FREE** . . . that one word sums up the year-after-year service of Bulletin 709 Solenoid Starters. Only one moving part . . . hence no tricky gadgets to corrode, stick, or break. No contact maintenance. Install the Bulletin 709 Starter and forget it. It's good for millions of trouble-free operations.

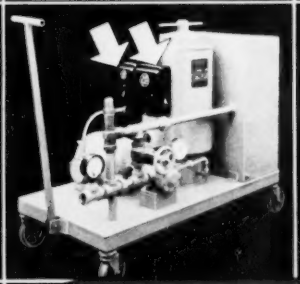
for MOBILE MOTORS



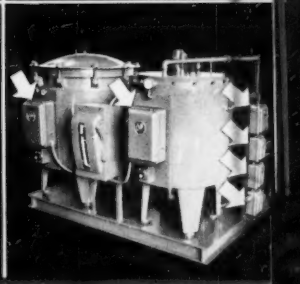
for PRINTING MACHINERY



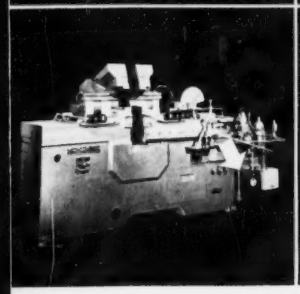
for PAINT SPRAYERS



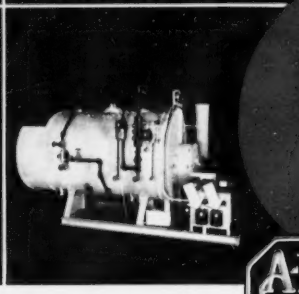
for OIL CONDITIONERS



for FLASH WELDERS



for STEAM GENERATORS



ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

A-B Quality

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wisconsin

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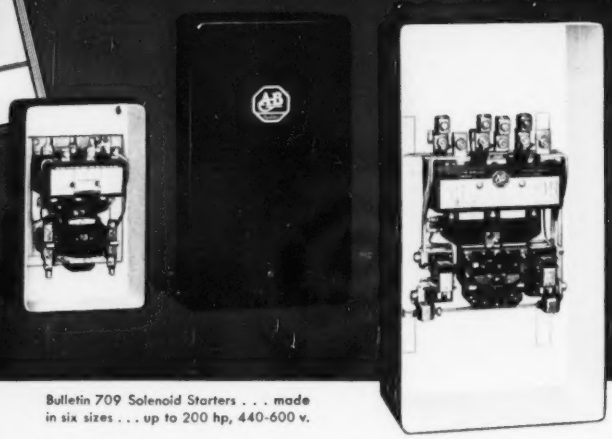
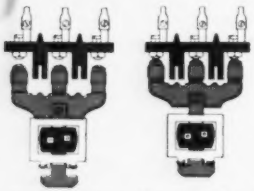
## ALLEN-BRADLEY CONTROLS



Bulletin 709 Solenoid Starters . . . made in six sizes . . . up to 200 hp, 440-600 v.

## Only ONE Moving Part



The 3 moving contacts, cross-bar, and solenoid plunger (shown in red) form a single unit, which moves UP and DOWN in the solenoid coil with a simple, straight-line motion.

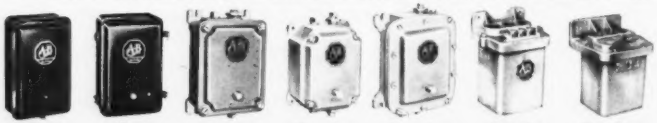
The 3 double-break, stationary contacts in the arc hood, to main line and motor, are "bridged" or closed by the moving contacts when the solenoid plunger is UP as shown above.

This compact Allen-Bradley catalog is a quick-and-easy reference manual on the performance, dimensions, and prices of starters, contactors, relays, push buttons, limit switches, etc., that exactly fit your needs.

Allen-Bradley solenoid motor controls are preferred by leading machinery manufacturers. Why? Because the simple design . . . ONLY ONE MOVING PART . . . means no pins, pivots, hinges, bearings, or other troublemaking parts. And their double-break, silver-alloy contacts need no maintenance. Write for catalog, today.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wisconsin

**THERE IS A STANDARD A-B ENCLOSURE FOR EVERY INDUSTRIAL NEED**



General Purpose | Dust-tight | Water-tight | Hazardous Dust | Hazardous Gas | Non-Haz. Cor. Gas | Haz. Corrosive Gas

A-B Quality

**ALLEN-BRADLEY**
SOLENOID STARTERS
QUALITY

# NEVER BEFORE!

## A G-E General-Purpose* Insulating Varnish

WITH THESE OUTSTANDING CHARACTERISTICS

G.E.'s new 9574

### ☑ EXCELLENT BONDING STRENGTH

**General-purpose 9574** has excellent bonding properties. It is ideal for all types of motor windings (except extra high-speed armatures), and has outstanding electrical characteristics.

### ☑ EASIER TO WORK

**G-E 9574** is a phenolic drying-oil varnish. It's particularly easy to use and handle. It has an unusually high flash point (100 F), and its viscosity (250 C. P. average at 45 F) makes it usable at barrel gravity.

### ☑ NO SPECIAL THINNERS REQUIRED

**G-E 9574** can be thinned with ordinary petroleum spirits up to 20%.

### ☑ CURES AT LOW TEMPERATURES

**This clear-baking varnish** cures at low temperatures. A baking cycle as low as 212 F is successful in conventional baking equipment.

### ☑ PENETRATES DEEPEST COILS

**G-E 9574** easily penetrates the deepest coils, forms an even film. Aging properties are excellent.

*G-E 9574 gives excellent results on all types of coils except extra high-speed armatures.*

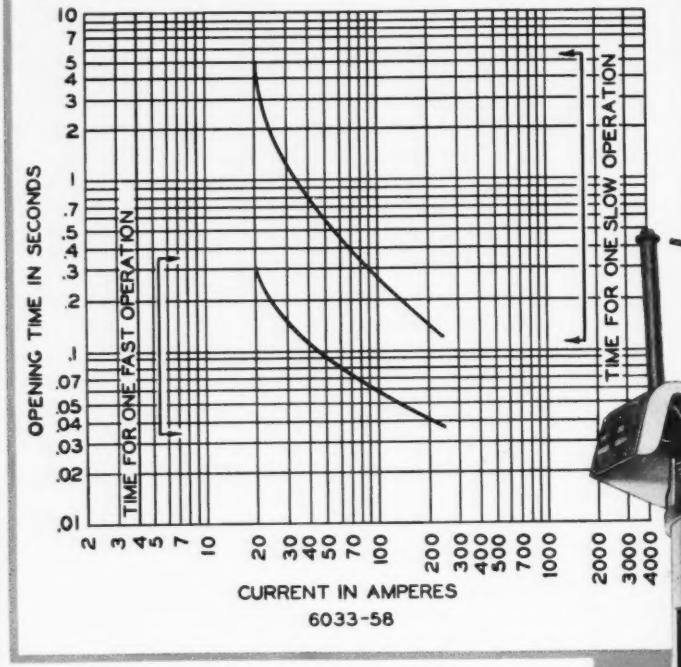
**MAKE YOUR MOTOR REPAIRS EASIER, MORE EFFICIENT BY USING G-E 9574!**

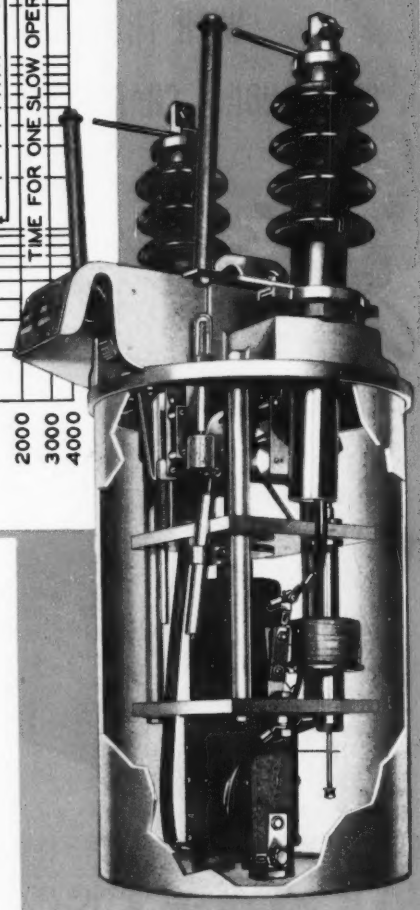
Get more information on this remarkable general-purpose insulating varnish. New bulletin gives you full details. Just write to your local G-E Distributor or Chemical Department, General Electric Company, Pittsfield, Mass.

*You Can Put Your Confidence in*

GENERAL ELECTRIC

# New Time Current



Shown above are the operating characteristics of the 10 ampere Kearney OCR. It is typical and the slope is the same for all ratings—5, 10, 15, 25, 35 and 50 ampere. Operating characteristics charts are available for all Kearney OCR's — simply specify the rating in which you are interested when you make your request.

# Characteristics

## of the KEARNEY OCR

## Permit Replacement of Any OCR on Your Line

Now you can take advantage of the improvements found only in the Kearney Oil Circuit Recloser.

The larger physical dimensions, greater oil capacity and greater arc quenching ability of the Kearney OCR are your assurance of less maintenance and less frequent oil changes. The new time current characteristics enable you to use the Kearney OCR regardless of the type now on your poles, and thus grade up your service for the increased loads of tomorrow.

At the right are sketches showing the simplicity and varied methods of installation of the Kearney OCR on poles or crossarms.

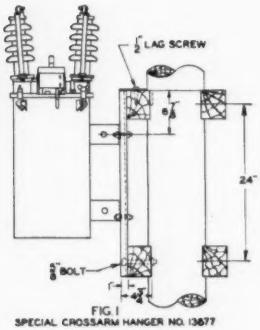


FIG. 1
SPECIAL CROSSARM HANGER NO. 13677

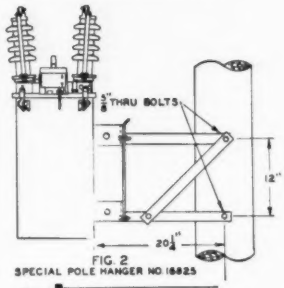


FIG. 2
SPECIAL POLE HANGER NO. 16825

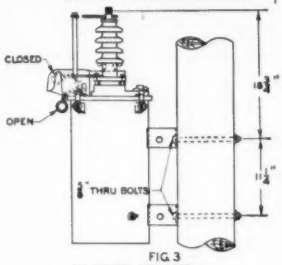


FIG. 3
NO HANGER REQUIRED

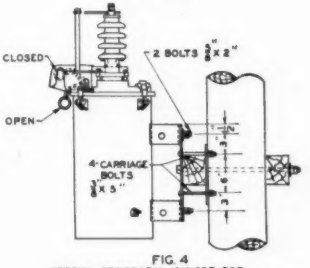


FIG. 4
SPECIAL CROSSARM HANGER FOR SINGLE DOUBLE ARM MOUNTING NO. 17208

FOR BETTER CONSTRUCTION AND MAINTENANCE

*Always Specify* KEARNEY PRODUCTS *for the Job*

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

4224-42 CLAYTON AVE. – ST. LOUIS 10, MISSOURI

*Canadian Plant, Guelph, Ontario*

West Coast Distributor: **MAYDWELL and HARTZELL, INC.**

# ONLY COMPLETELY-PROTECTED CONDUCTORS ASSURE Longest-Lived WIRES AND CABLES

. . . and only Okolite-Okoprene cables possess these 9 "factors of protection"

With today's installation costs* only the Longest-Lived will be economical

* The lifetime cost of a cable rather than its first cost is the only true measure. Okonite wires and cables, built to stand up better and longer, can offset high installation costs.

❶ Conductors are coated with corrosion-resistant Okoloy, a lead alloy that outlasts tinning 2 to 1.

❷ Internal corona cutting is eliminated and dielectric strength increased by Semicon Tape applied over the conductor on all Okolite-Okoprene cables operating at over 2000 volts.

❸ Moisture-resisting, high-voltage Okolite, an oil-base insulation proved in over 20 years of service, is made with Up-River Fine Para, the best grade of natural rubber. Approved as Type RWSN by Underwriters' Laboratories.

❹ The Okoprene covering, a pioneering development of the Okonite laboratories, has established its stability and permanence on millions of feet of cable installed since 1935 under the most severe conditions.

❺ Both insulation and jacket are applied together in a single operation by the strip-process and uniformly vulcanized in a continuous metal mold to give the best and most dependable bond.

❻ Insulation and covering receive but a single vulcanizing "cure" thus eliminating the life-shortening effects of double vulcanization.

❼ Thickness of both insulation and jacket are accurately controlled by the Okonite strip-insulating process.

❽ In addition to a. c. tests, every Okolite-Okoprene cable is subjected to high-voltage d. c. tests more severe than used by any other cable manufacturer.

❾ Okolite-Okoprene cables have the longest and most extensive service record.

Okolite-Okoprene's electrical operating advantages, installation advantages and design advantages are given along with dimensional data in illustrated, information-crammed Bulletin WE-1037. For a copy, please address The Okonite Company, Passaic, New Jersey.

6627

OKONITE insulated wires and cables

THE BEST CABLE IS YOUR BEST POLICY

what's new in GE street lighting

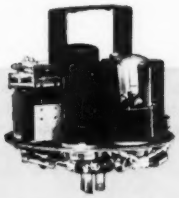
# NOW! Built-in photoelectric control for individual luminaires

Here is the answer to controlling individual luminaires on a multiple street-lighting circuit! It is the new G-E Form 110 luminaire—a slip-fitter suspension-type luminaire that will take almost any G-E optical system, and that contains a built-in photoelectric relay control.

This control eliminates the need for pilot circuits or separate control devices of any type. The luminaire is wired into the power source—and the relay turns the lamp on or off according to seeing conditions. Installation time and costs are radically reduced.

- Adjustable to operate anywhere between 1 and 6 foot-candles—with a minimum difference of 1/2 foot candle between "turn-on" and "turn-off." Practically unaffected by any voltage variation between 105 and 130 volts.
- Tube life of several years with period between inspections recommended at 2 to 3 years. Uses standard radio tubes (6SQ7 and 6V6).
- Easily maintained. Entire photoelectric control unit plugs into hood—can be replaced in a matter of seconds, with actual repair work done in shop. No tools required for field servicing.
- Does not require resetting after power failure.
- Entire control consumes only 8 watts—and can handle lamps up to 900 watts.

For full information on this self-controlled luminaire, call our nearest office or write to *Apparatus Department, General Electric Co., Schenectady 5, New York.*



***This is the complete photoelectric relay used with the Form 110 luminaire. It employs two readily available vacuum tubes and a red-sensitive photoelectric cell.***

***Mr. A. M. Bjontegard, General Electric design engineer, shows how the entire photoelectric relay may be lifted off the Form 110 luminaire without disturbing alignment.***

GENERAL ELECTRIC

650-78

***Are you tying in with the NEMA plan to give America better street lighting?***

# Important Questions..

## about iron and steel scrap for every top business man in every industry

**Q.** ***How* bad *is the shortage of scrap?***

**A.** Actually, we have enough scrap to get along, but too much of it is *light* scrap. What is badly needed today is more *heavy* scrap.

**Q.** ***Why more* heavy *scrap?***

**A.** Because heavy scrap will produce *more and better* steel in *less* time.

**Q.** ***Why is the heavy scrap shortage so* harmful *to our economy?***

**A.** Half of all the ingredients that are melted to make steel and castings consists of scrap iron and steel. The short supply of heavy scrap during the past year limited the production of steel mills and foundries. At the present record rate of production, there is still not nearly enough steel to meet the current and anticipated demands of our domestic economy, military requirements, and ERP. More heavy scrap will help bridge the gap.

**Q.** ***What's being* done *about it?***

**A.** A drive . . . and everybody is cooperating . . . is being started for industrial scrap, to (1) help step up present steel production, and (2) *create a visible reserve of heavy scrap in the event of national emergency.*

**Q.** **Why *is there a shortage of heavy scrap?***

**A.** Several reasons:

1. Very little of the 123,000,000 tons of steel and steel products exported during the war has come back as scrap.
2. With replacements scarce and expensive, much old equipment which would normally have been junked by now, is still in use.
3. A halt has been called on the junking of old vessels and military equipment which has until recently been a source of scrap.
4. The amount of heavy scrap produced in fabrication —the left-overs of machinery, etc.—is not enough to meet the demand for new steel and castings.

**Q.** ***How about the heavy scrap that must exist in huge quantities in* Germany *and* Japan?**

**A.** Some of this will be coming through, but not in good quantities until preparation and transportation facilities within those countries improve.

**Q.** ***Where can* additional *scrap be obtained from domestic sources?***

**A.** From industrial plants which have on hand large amounts of heavy scrap in the form of obsolete machinery, idle equipment—tools, dies, jigs, fixtures, etc.—and unnecessarily large repair parts inventories. Such scrap is the best possible type for the manufacture of quality steel.

**Q.** ***Isn't such material* ordinarily *turned in as scrap?***

**A.** Experience shows that plant "housekeeping" is not particularly good when plant production is high. People are too busy. However, if executives realized the critical situation, they would order the necessary steps to be taken.

**Q.** ***How can I help in this drive?***

**A.** Appoint one top official in your plant as a Salvage Director —with full authority to give orders and throw out everything that is not going to be needed. Have him consult with your trade association's Steel Scrap Drive Committee. Call in your local scrap dealer. (Incidentally, the prices paid for scrap are the highest ever.) Promote your scrap drive by meetings of department heads and through plant bulletin boards and newspapers.

**Q.** ***How do I benefit from moving scrap in addition to the money received for it?***

**A.** 1. You get the use of much-needed and expensive floor space now occupied by such equipment and material.
2. You eliminate the cost of keeping records and inventory.

**Q.** ***When does the scrap drive* start?**

**A.** Right this minute. The very next thing to do after reading this page, should be to start *your* plant's scrap drive!

**Q.** ***What is the goal of this drive?***

**A.** One million tons of *heavy* scrap . . . and "housecleaning" in your plant will help.

A PUBLIC SERVICE PROJECT · THE ADVERTISING COUNCIL ·

**SCRAPPY SAYS:**

***Search your plant for HEAVY SCRAP ...Help make MORE STEEL!***

**ELECTRICAL WEST**

# How Big is the CORE

# of your POWER apple?

Densheath Type TW Building Wire with its special thermoplastic insulation is sound production insurance in any plant. It will not support combustion, is long-aging, impervious to acids, oils and alkalis. It is recognized by the National Electrical Code for circuits up to 600 volts and temperatures up to 140° F. . . . and for wet and oily locations. Being light weight, with a smooth, slick finish and without braid, Densheath pulls through easier . . . resists abrasion. Permanent, bright colors for quick circuit identification. Write for literature.

This is important, too—*for rewiring in existing raceways*, the Code recognizes the smaller diameter of Densheath TW and permits more conductors to be pulled in the same size conduit. Here is a typical case—

**½" CONDUIT**

| Type R | Type TW |
|---|---|
| | |
| 3 #10 Wires | 6 #10 Wires |

HOW MUCH of the electric power you pay for do you *throw over your shoulder* through overloaded, overextended, obsolete, inadequate wiring?*

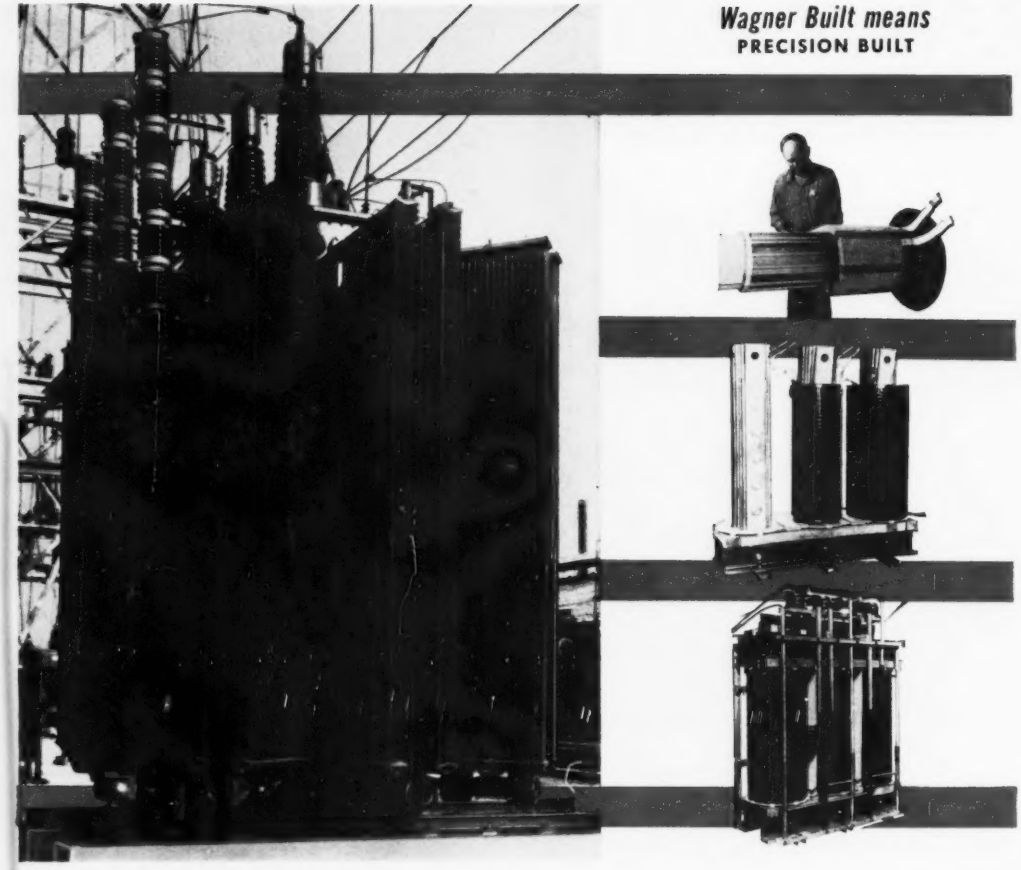
Avoid wasting power. Find present losses and safeguard future expansion. Talk to your plant power engineer, consulting engineer, electrical contractor, wholesaler or utility power salesman. It's their job to advise and protect you against slow-downs and shut-downs that mean unproductive wages, lost production, spoilage.

***WIRE AHEAD** . . . a comprehensive discussion of preventive maintenance, points out the symptoms of inadequate wiring, presents detailed plans for anticipating electrical demand. Forty-eight factual pages of practical information and suggestions free on request.

ANACONDA
from mine to consumer

**ANACONDA WIRE & CABLE COMPANY**

**25 Broadway, New York 4, N. Y.**




# BUILT TO A REPUTATION by Wagner

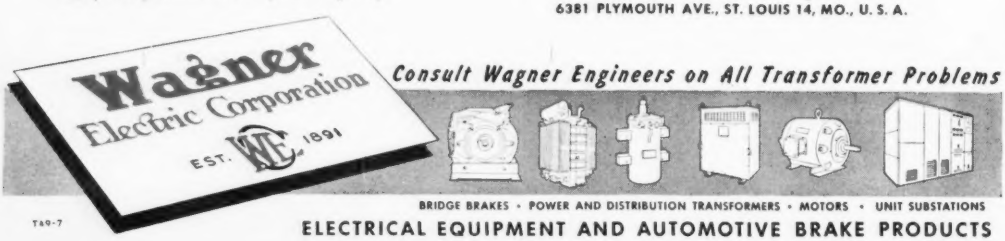
Wagner Power Transformers are transformers with a reputation for Quality—established through more than fifty-five years of service to the power industry. Meticulous attention to even the smallest details of construction is responsible for this reputation.

Liberal design, coupled with painstaking care in manufacture, has given Wagner Power Transformers the stamina to maintain a continuous flow of power, even under the frequent overloads demanded by today's requirements on system capacity.

Users of power transformers will find it to their advantage to consult Wagner on their next transformer installation. Users of Wagner transformers also profit by nationwide service facilities.

Twenty-nine branches, located in principal cities, and manned by trained field engineers, are at your service. Bulletins TU-180 and TU-181 give information on the complete line of Wagner Transformers.

**Wagner Electric Corporation**
6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.



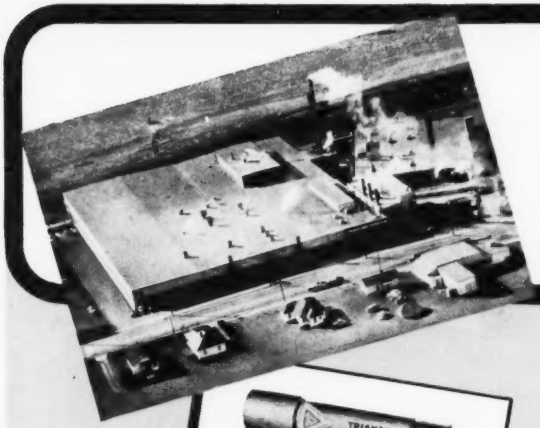

*Consult Wagner Engineers on All Transformer Problems*

BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

ELECTRICAL EQUIPMENT AND AUTOMOTIVE BRAKE PRODUCTS

TA9-7

# TRIANGLE'S NEWLY EXPANDED CONDUIT PLANT



Triangle Rigid Steel Conduit finish is hot dip galvanized, uniformly both inside and outside, with additional protection assured by a baked-on coat of specially prepared linseed oil base lacquer. Available in sizes from ½ to 6 inches, with couplings and elbows to fit.

Triangle Electric Metallic Thin Wall Conduit is welded from high grade steel strip, insuring a perfectly true tube of uniform thickness and strength. Hot dip galvanized uniformly both inside as well as outside. Threadless. Available in ½ through 2 inch sizes.

**Now your requirements for rigid steel and thin wall conduit can be met faster, more dependably, since Triangle's newly expanded plant is in production. Located in Moundsville, W. Va., hard by the steel center of Wheeling, this enlarged manufacturing establishment incorporates latest advancements in production equipment to assure greater output and the uniformly high quality for which Triangle has been famous for over 30 years.**

**While output of steel conduit is at present limited by circumstances beyond Triangle's control, when these conditions change you can count on Triangle for an *immediate* increase in shipments. If there's a bottleneck in steel conduit, it won't be in Triangle's new Moundsville plant!**

**For *Extra* quality — at NO extra cost — insist on TRIANGLE!**

# NOW SERVES YOU Better, Faster!

*If It Bears This Trade Mark* *It's Made by Triangle . . .*
*If It's Made by Triangle IT MUST BE RIGHT!*

For latest information on deliveries, contact your nearest Triangle distributor or representative, or write

**TRIANGLE CONDUIT & CABLE CO., INC.** · 1904 JERSEY AVE., NEW BRUNSWICK, N. J.

ARTERIES FOR ELECTRICAL SYSTEMS INCORPORATED

IT MUST BE RIGHT!

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# We are now on ...our 5th Million ...of forced-cooled transformers like this

About ten years ago, General Electric took the initiative in radically redesigning large power transformers by completely changing the cooling system—by using a combination of forced oil and forced air with greatly increased velocities.

This new type of transformer has made possible:

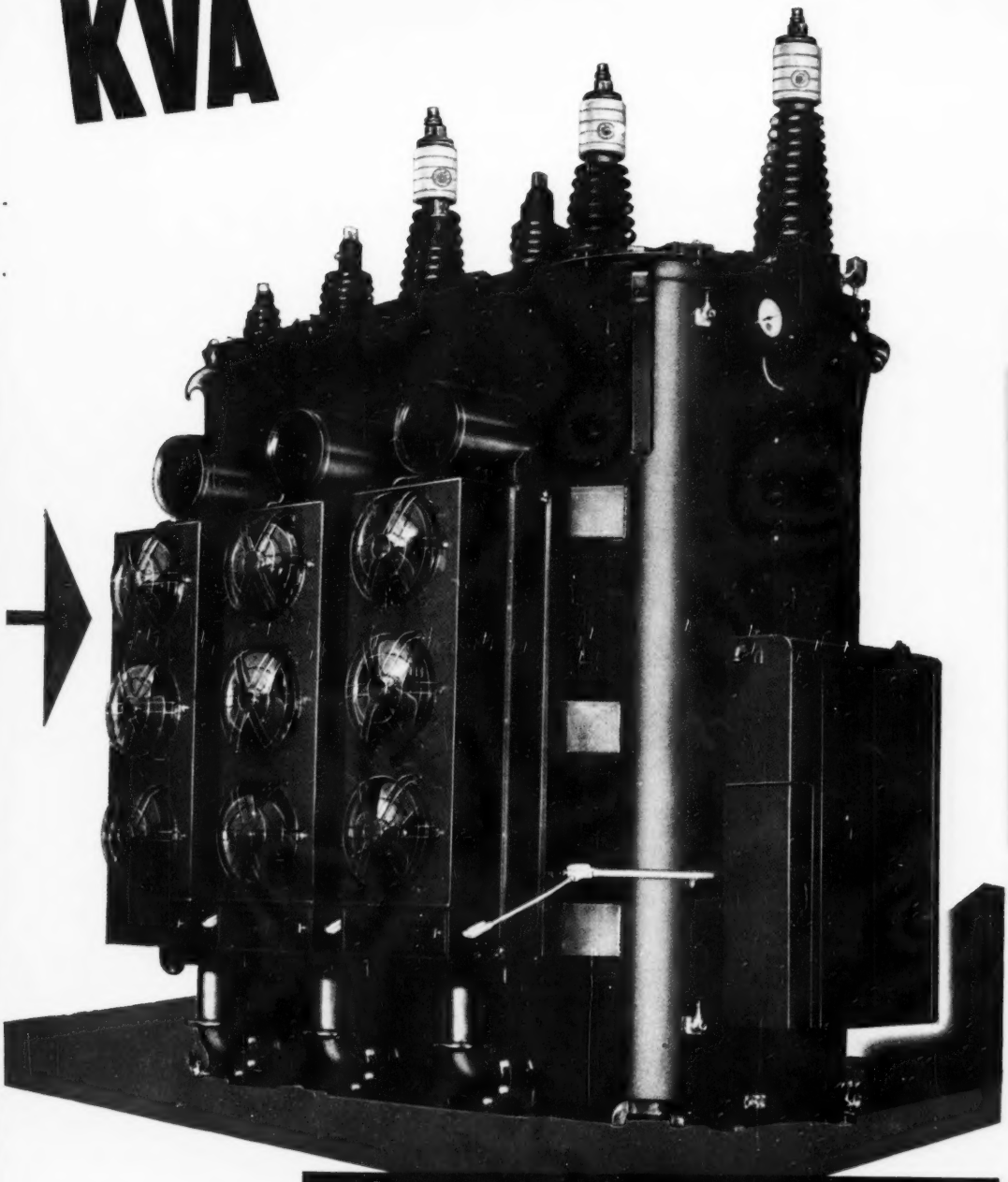
- A first cost below that of comparably rated self-cooled or fan-cooled transformers.
- Reduced installation time and expense, because the smaller size and weight makes it possible to ship transformers of very large capacity with only the bushings removed, or even completely assembled.
- A more compact installation of transformers, because of their reduced size and because arresters, load ratio control and other auxiliaries can be mounted more compactly.

We have now built or have on order more than 4 million kva of transformers with forced-oil-air cooling. The trend is definitely toward the use of this type of transformer, especially in units 50,000 KVA and above. For example, we recently completed a 110,000 kva transformer for an eastern utility company and two more are on order. Even larger transformers are in store, as three 145,000 kva transformers will be built for another electric utility.

The economic advantages of forced-oil-air cooling in large power transformer are so pronounced that we believe you should investigate them. Our Bulletin GEA-3934 gives some of the details.

This type of cooling represents but one example of present-day accomplishments in large transformer design. You can continue to look to General Electric for leadership in power transformers. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

# KVA



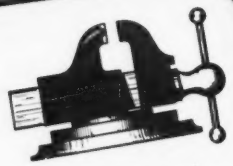
GENERAL ELECTRIC

# FARGO "ONE PIECE" CONNECTORS

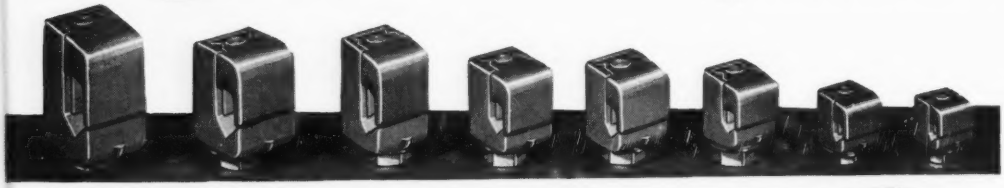
*Built* LIKE A *Vise*

*Grip* LIKE A *Vise*

*Easy* TO USE AS A *Vise*



Available in sizes from #8 to 1,000,000 CM. Two sizes of bolt heads (½" and ⅝") fit the range from #8 to 4/0, the sizes most commonly used by linemen.



## *"Easy-to-use"* TOOLS, TOO!

Although any open end, adjustable or socket wrench will do . . . each of the following styles will fit the eight sizes (#8 to 4/0) linemen use most frequently. They are handy, speedy . . . and fit a number of other applications, too.

GP 200

A standard socket with one size on each side of the head.

GP 201

A flat ratchet with box type sockets on each end.

GP 202

The GP 200 with a molded handle which offers a better grip and insulates the handle.

Distributed by
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Manufactured by
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LM

**Another achievement of Shell Research—**

# SHELL DIALA OIL A·X

## a revolutionary transformer oil that gives 50-year service

### *We went into the problem of oil oxidation*

We studied how, under heavy load conditions in transformers, both heat and oxygen could change an oil chemically . . . cause sludge, acidic deterioration products and peroxides. These are the impurities which reduce cooling efficiency . . . damage cloth insulation . . . ultimately corrode exposed copper and iron surfaces. Until our study, there wasn't much you could do about it except to spend money on oil changes and transformer overhaul, or invest in expensive oil protection devices such as conservators.

### *Shell Diala Oil AX was developed to step costs down*

We examined Shell Diala Oil AX against all competitive oils on the market, comparing rates of oxygen absorption at high temperatures as well as more commonly measured properties. Even our top research men were surprised when Shell Diala Oil AX resisted oxidation *140 times longer* than the next best transformer oil. Judging by these accelerated tests, Shell Diala Oil AX *can last better than 50 years in even an open, air-breathing transformer.* That means money saved and then some!

### *And that isn't all—*

Further tests proved that Shell Diala Oil AX, in addition to its remarkable oxidation resistance, possesses all other properties required of superior transformer oil . . . excellent thermal transfer, a dielectric strength above 30,000 volts . . . a very low pour point . . . minimum volatility . . . up to 37% less fabric deterioration. And it is equally effective for oil-filled switches. Ask your Shell representative where and how it can help you.

**ARE YOU ABSOLUTELY SURE YOU ARE GETTING ALL THAT'S NEW IN LUBRICATION?**

Your Shell Lubrication Engineer can make a complete study and analysis of your plant and machines . . . give you engineering counsel, advice on new lubricants and their application . . . help you set up schedules and controls for each and every machine. For that kind of service — call in your Shell Lubrication Engineer.

SHELL

**OFF TO A GOOD START!**

The skill, the know-how, the modern equipment this sheet of steel will encounter in the Smoot-Holman plant will accomplish an amazing transformation. By the time it emerges as a completed luminaire, it will have undergone exhaustive tests and processes of inspection — a product of which we can be proud . . . and with which the user will find long-lasting satisfaction.

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# ELECTRICAL BOOKS

STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS, 8th Edition just published, Archer E. Knowlton, editor-in-chief, 6x9 2,311 pages, McGraw-Hill Book Co., $12. The Handbook's 26 sections, representing the combined work of 101 electrical engineering authorities, reflect the tremendous strides made by the electrical engineering profession in recent years. All important developments are included: radar and associated microwave techniques, nuclear energy, induction and dielectic heating, new elastomers and plastics, new standardization, etc. The new edition features a recasting of material on conductors, a revamping of the sections on generators and transformers, a conciseness and clarity that makes every section an orderly compilation of working tool information.

INDUSTRIAL ELECTRONICS AND CONTROL, by Royce G. Kloeffler, 6x9, 477 pages, John Wiley & Sons Inc., $5.50. An introductory book written to give engineers a survey of the theory and application of electronics in industry. Problems, illustrations and simple and direct style should enable the reader to learn the subject by his own efforts.

ELECTRICIAN'S POCKET COMPANION, by Benjamin Goldberg, 5x7, 442 pages, Murray Hill Books Inc., $2.50. Handy-sized for pocket or tool kit, containing facts, figures and methods needed constantly by electricians; covers motors, meters, transformers, lighting, wiring, domestic heating systems, code requirements, circuit fundamentals, safety, tools and time saving methods.

CATHODE RAY TUBE DISPLAYS, MIT Radiation Laboratory series No. 22, edited by Soller, Starr and Valley, 746 pages, 6x9, McGraw-Hill Book Co., $10. Covers details of design of simple electronic computing systems followed by several illustrative applications to the solution of aircraft navigation and the synthesis of radar data for training purposes. A second part is devoted to practical aspects of the design of lightweight, low-power servomechanisms.

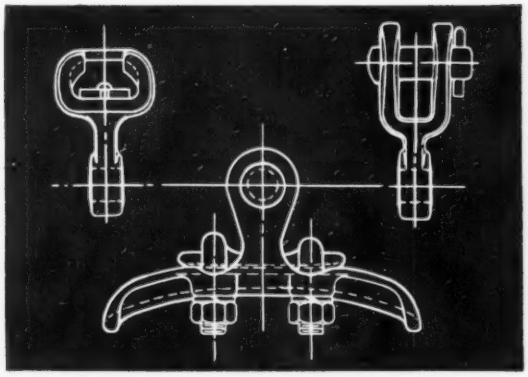
RADIO ENGINEERING, by E. K. Sandeman, 775 pages, 6x9, John Wiley & Sons Inc., $6.50. Originally planned as instruction for maintenance engineers at B.B.C. transmitting stations; is designed to give beginners in radio needed working principles in the shortest possible time. Experienced engineers and designers of radio equipment and circuits should find it a valuable reference work.

THERMODYNAMICS, by Edward F. Obert, 510 pages, 6x9, McGraw-Hill Book Co., $5.50. A fundamental text in thermodynamics for engineering students; presents a comprehensive and detailed treatment of the subject, offers material on airconditioning, refrigeration, gas turbines etc., and provides material that must be understood by the practicing engineer.

FUNDAMENTALS OF LIGHT AND LIGHTING is the title of a letter-sized, spiral-bound bulletin of 86 pages, prepared by the Engineering Division, Lamp Department, General Electric Co., which sells for $1.00. It contains practically all the answers sought.

# New BTC Forged Steel Suspension Clamps with Design Improvements

6200A-U
for Conductor



New Series 6200A Forged Steel Suspension Clamps for all Conductors and Ground Wires, except the Hollow Copper Types.

In the interest of improved field performance, the popular Series 6200 clamps has been redesigned.

Lighter weight, shorter Clamp Body, improved Clamp-Body-Seat and Keeper contours, and maximum clamping pressure at Keeper center are factors in preventing possible cable-vibration damage. Greater Vertical-Line-Angle accommodation. Socket and new clevis connectors are forged steel. Absence of corona-inducing sharp edges.

| Cable Sizes | Catalog Numbers — Type of Connector | | | Body Length | Ultimate Strength Pounds |
|---|---|---|---|---|---|
| | Socket | Clevis | None | | |
| .125″ to .46″ | 6200A | 6230A | 6240A | 6½″ | 15,000 |
| .312″ to .60″ | 6201A | 6231A | 6241A | 6½″ | 17,000 |
| .187″ to .60″ | *6251A | *6261A | *6271A | 6½″ | 17,000 |
| .50″ to .70″ | 6202A | 6232A | 6242A | 7¼″ | 18,000 |
| .50″ to .82″ | 6203A | 6233A | 6243A | 7¼″ | 18,000 |
| .625″ to 1.00″ | 6204A | 6234A | 6244A | 8″ | 25,000 |
| .625″ to 1.15″ | 6205A | 6235A | 6245A | 8″ | 25,000 |
| .85″ to 1.27″ | 6255A | 6265A | 6275A | 9½″ | 25,000 |
| 1.125″ to 1.375″ | 6206A | 6236A | 6246A | 9½″ | 25,000 |
| 1.125″ to 1.45″ | 6257A | 6267A | 6277A | 9½″ | 25,000 |
| 1.125″ to 1.60″ | 6207A | 6237A | 6247A | 9½″ | 25,000 |
| 1.375″ to 1.80″ | 6208A | 6238A | 6248A | 10½″ | 25,000 |
| 1.375″ to 2.00″ | 6209A | 6239A | 6249A | 10½″ | 25,000 |
| 1.625″ to 2.25″ | 6210A | 6280A | 6290A | 11¼″ | 25,000 |
| *Reversible Two-Groove Keeper for greater Cable Size Range | | | | | |

*Specify J or U Bolts by suffix "J" or "U" to catalog number. Specify Copper or Aluminum liners when required.*

A postcard puts your name on our mailing list for data sheets.

***Sold only through your insulator manufacturer***

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# KLEIN

## "Pole Master" CLIMBERS*

*Gaff is in line with the leg bone.*

**1945 POLEMASTER CLIMBERS** Riveted Top Wrought Loop, Triangular Ring at Ankle (average weight) 2⅞ lbs. per pair. (With this Climber, use Ankle Strap No. 5301-16 or No. 5301-26).

### "solid comfort" for linemen

■ There's greater comfort for the lineman in the *new* Klein "Pole Master" Climbers. Designed as a real working pair . . . with one climber especially for the right and the other for the left . . . they have an extra wide stirrup for greater arch support.

Leg irons are tough and dependable, yet flexible and tapered in width and thickness. Ankles and calves get better support . . . chafing is practically eliminated. And the scientifically offset shank brings gaff in proper line with leg bone, providing real security . . . solid comfort.

"Pole Master" Climbers are forged from high quality, special alloy steel. A wrought, triangular-shaped ring at ankle assures proper set of ankle strap and provides additional comfort . . . safer, longer strap life. "Pole Masters" . . . like all Klein climbers . . . are individually tested and suitable for linemen of any weight.

** Matched Right and Left Climbers*

**ASK YOUR SUPPLIER**

Foreign Distributor: International Standard Electric Corp., New York Since 1857

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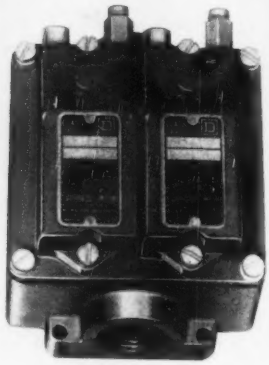
# PRODUCT NEWS

### Aluminum Model (300)

Westinghouse has developed an all-aluminum model of the industrial Precipitron, claimed to handle a 10% greater volume of air than previous units of the same size. There are 99 plates in the new model, compared to 111 in the old, but 3 in. additional length in each plate give the new unit 17% more dirt-trapping area, the manufacturer states.

The new model will be built in two sizes, one 36 in. wide, the other 24 in. wide. The larger unit can clean 1,000 cu. ft. of air a minute; the smaller, 667 cu. ft. Installed in conjunction with ventilation systems, the cells are stacked in tiers according to buildings' air cleaning needs. The 36-in. aluminum cell weighs 65 lb. less than the old cell for the same capacity.

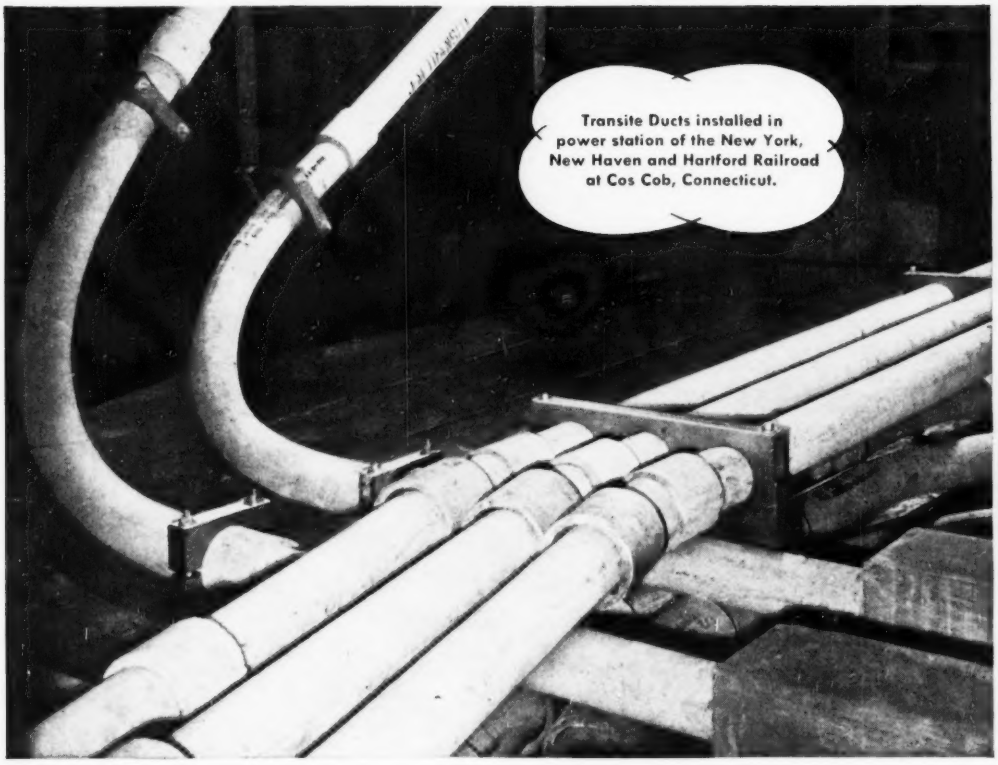
### Limit Switches (301)



Square D has announced new duplex limit switches said to permit machine designers to use only one switching unit when two limit switches are needed. By using two oiltight switches in a single duplex assembly, only one run of conduit is required for necessary control wires, the announcement states. Both surface-mounting and flush-mounting types are available. Each switch has a single-pole, double-throw snap-action mechanism and two electrical circuits. One circuit is normally open and the other normally closed. Switches come with either two push rods, two plain roller arms or two one-way rollers. Return springs can be changed readily for the reverse direction of operation. On roller arm types, removal of the spring provides maintained contact operation. Switches are rated to 600 volts a-c or d-c. Single switch units are approximately 3⅞ in. long, 1½ in. wide and 3 in. high to top of roller arm.

### Circuit Breaker (302)

A new 69-kv. oil blast power circuit breaker, type FK-439, has been announced by G-E in interrupting ratings of 1,000, 1,500 and 2,500 mva.; continuous ratings of 600 and 1,200 amp.; 8- or 5-cycle interrupting time and 20-cycle reclosing.




# These Transite Ducts safeguard Cos Cob's Power Lines

Transite* Ducts were chosen for the important job of protecting the power lines in the New Haven's Central Power Station at Cos Cob because they meet every requirement of a low-cost efficient cableway system.

*These asbestos-cement ducts provide 5 major advantages:*

1. Easy to Install—Transite Ducts are light in weight and come in long 10-foot lengths that are easy and economical to assemble and install.
2. Strong, Corrosion-Resistant—Transite is made of asbestos and cement combined under great pressure into a permanently strong structure. These ducts are practically unaffected by corrosive soils.
3. Immune to Electrolysis—Entirely inorganic and non-metallic, Transite Ducts are immune to electrolytic or galvanic action.
4. Permanently Smooth Bore—Long cable pulls and replacements are easy with Transite Ducts. Their smooth bore minimizes damage to cables.
5. Incombustible—Transite Ducts confine burnouts, protect adjacent cables in case of fire.

*Reg. U. S. Pat. Off.

For further information on how Transite Ducts can increase the safety and cut the costs of cableway systems, write Johns-Manville, Box 290, New York 16, N. Y.

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**Johns-Manville TRANSITE DUCTS**

Always in the spotlight...
NOMA
DECORATIVE OUTFIT
EACH LAMP BURNS INDEPENDENTLY
3415 INDOOR SET
Favorite for tree trimming. 15 lights . . . each burns independently.
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Series string. Best seller again! Bubbling, sparkling magic on the tree!
CASH IN ON NOMA
"Preferred by Customers
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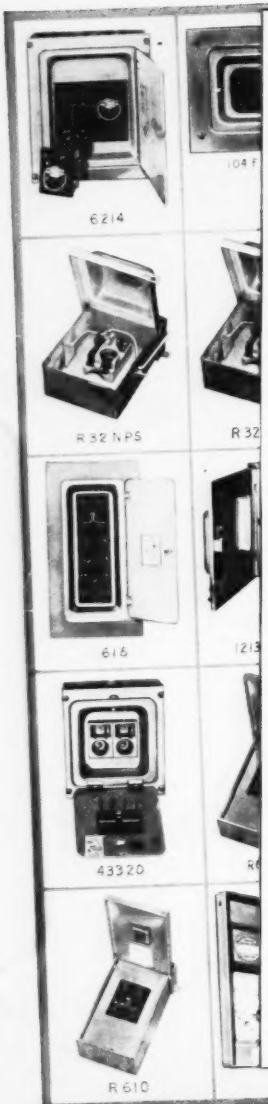



*The switch is to*

# GENERAL

General Switch Corporation are specialists in the design, engineering, and production of Enclosed Safety Switches, Service Entrance Equipment, Branch-Circuit or Residence Panels, Panelboards for Light and Power Distribution.

*Designed for*

★ GREATER CONVENIENCE
★ BETTER APPEARANCE
★ TROUBLE-FREE PERFORMANCE

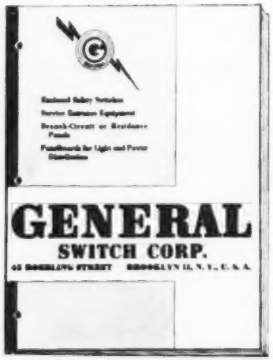
*Easy to install • Easy to service*

Send for the latest GENERAL catalog, complete with illustrations, specifications, mounting dimensions, selection tables, wiring data, knockout layouts, and a cross index of comparative catalog numbers.

Copies sent free on request.

*More and more Contractors and Wholesalers are switching to*

**GENERAL**




## GENERAL SWITCH CORP.

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Dallas 5, Texas
*Detroit 26, Mich.
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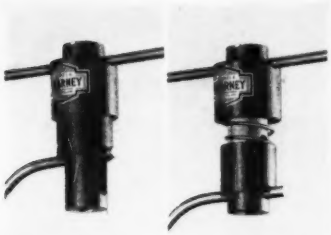
Phoenix, Arizona
*Portland 9, Oregon
Princeton, Indiana
San Antonio 2, Tex.
*San Francisco 3, Cal.
*Seattle 4, Wash.
Spokane 8, Wash.
St. Louis 8, Mo.
Syracuse, N. Y.
Wethersfield 9, Conn.

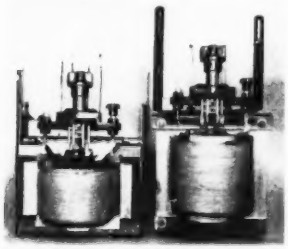
EXPORT OFFICE: NEW YORK 11, N. Y.

### Fuse Cutout (303)



Simplified in design and operation, Kearney's new type A secondary fuse cutout is refused and installed in three steps in less than 12 seconds, according to an announcement from the manufacturer. No nuts or bolts are used and no tools are needed. It handles up to No. 2 stranded or No. 1 solid copper wire, 100 amp., 250 volts; is connected directly to silver-plated fuse terminals, to assure low heat loss. Cutout consists of six simple permanently assembled parts of Bakelite or stainless steel. Light-reflecting glass-beaded yellow inner surface, automatically exposed, vividly signals blown measures 4x1⅝ in. Fuse shown left in service, right, blown.

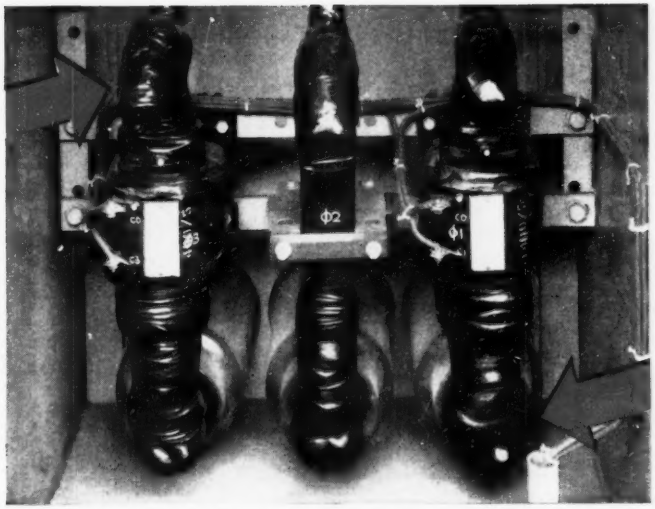
### Transformer (304)



Moloney Electric has in production its new HiperCore distribution transformer in both conventional and CSP types. According to the manufacturer, wound cores of high permeability, oriented, silicon steel, having a 30 to 35% greater flux carrying capacity than hot rolled steel, decrease weight 15 to 30%, give size reduction up to 30%. The new transformers are said to have improved short-time overload characteristics, reduced coil mass with lower hottest spot temperature gradient. Available in 50 kva. and smaller in voltage classes 15 kv. and below.

### Oiler (305)

For equipment having solid bearings oiled from the top where a measured quantity of filtered oil is desirable, Trico Fuse offers its new variable-feed wick oiler with removable wick retainer. Feed of oil is controlled by varying size of wick embodied in tamper-proof base fitting. Greater feed variation may be secured by using lighter or heavier oil. Is claimed to feed oil or liquids as thin as water or as heavy as molasses. Available in four types, with or without sight fitting and with or without feed shut off; 1-, 2-, 4- and 8-oz. capacities in each type.



Rear of switchgear cubicle showing 2,300 volt line-connectors insulated in 5,000 volt classification with "Scotch" Electrical Tape No. 22—anticipating a future increase to over 4,000 volts.


# Two "Powerhouse" Tapes
## For Powerhouse Installations

**QUICK FACTS**
**about "SCOTCH" Electrical Tapes No. 33 and No. 22**

- Tough, impervious plastic backing.
- Stretchy, to conform to odd shapes.
- High Dielectric Strength.
- Thin Caliper (.007"), takesup minimum room in junction boxes, etc.

No. 33—For jobs where extra width is not a factor. Available in standard ¾ inch width.

No. 22—For heavy installations needing maximum coverage. Available in up to 4 inch widths.

"SCOTCH" Electrical Tapes No. 33 and No. 22—Plastic Backed—are tough, stretchy, impervious, and remarkable for *high dielectric strength, with thin caliper*. In a relatively short time they have stepped into the key spot for heavy insulation work on powerhouse equipment.

No. 22 is intended for very heavy installations and maximum coverage on bus bars, etc. No. 33 is used wherever the extra width of No. 22 is not a factor. "SCOTCH" Electrical Tapes with plastic backing are easier to apply than other insulating material, and the completed job is highly efficient, ship-shape and mighty good looking.

If you are not familiar with these remarkable new "SCOTCH" Electrical Tapes, a letter to us requesting complete information and samples will have our best attention.

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. . . concrete runways where cornstalks once grew? Why not? In ten years, Farmer Jones's cornfield may be an airport.

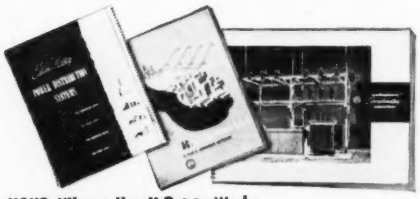
**Are you ready for some of these power distribution unknowns?**

Decisions based on such future predictions are particularly difficult in your business. Today, the *real* solution lies in your "system planning". It's the sure way of handling present AND future loads.

Scrap your present equipment? Certainly not. BUT . . . have a *modern system plan* in mind *before* you make replacements and extensions to your present system. Gradually, your old system is replaced. In the years to come, *all* of your greatly expanded system will be a part of the *system* you plan today.

We, too, find it difficult to predict the future. BUT, for many years our engineers have worked with utilities throughout the country. This wide experience has enabled them to answer *all* types of distribution problems. Together with your engineers they have found it is the combination of system planning *and* co-ordinated apparatus that provide effective answers to *your* unknown load trends ahead.

Our engineers, our calculating boards and complete service organization are available to help with *your* problems. We urge you to call on this group as you need them in your *system planning*. Call your nearest Westinghouse office or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania. J-97137



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**"Co-ordinated Substation", B-4061**—presents a complete, standardized line of substation designed and manufactured to answer any *system* requirement.

**"A-C Secondary Network Systems", B-4002**—is the complete story of a system that has saved the utilities at least $175,000,000.

***WRITE FOR A PRESENTATION OF THIS VALUABLE INFORMATION***

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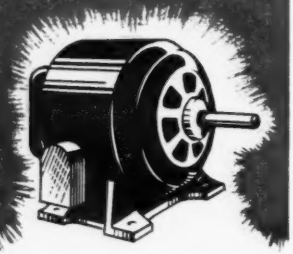
THE PLUS FACTOR OF MOTOR PERFORMANCE



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## Motor Starter (306)

Trumbull Electric is offering a new magnetic motor starter and magnetic contactor designed to give maximum protection to a-c motors up to 50 hp., 440 volts. Features are the relay heaters and plastic-encased coil. According to the manufacturer, the bi-metallic relay heaters will accurately follow the heating curve of the motor; the relay adjusts easily for automatic or manual reset; the plastic-encased coil is to protect windings from moisture, corrosion and abrasion; has a permanent, self-lubricating composition impregnated into the plastic to keep the magnet guides sliding smoothly and to eliminate low-voltage chatter.

## Cutout (307)

Westinghouse has announced a type HC, high-capacity cutout with an interrupting capacity of 8,000 amp. at 2,500 volts or 5,000 amp. at 5 kv. It is rated at 5 kv., 50 amp. and will take any standard universal-type fuse link up to its capacity. It is applicable for use on 2,400-volt delta, 4,160-volt Y, 4,800-volt delta and 8,300-volt grounded Y systems. It consists of the porcelain box used in the current EA standard interrupting capacity design and a new, high-strength, high-capacity door. The door may be purchased separately and used as a replacement on present EA cutouts, if desired.

## Lightning Protector (308)

A Thyrite lightning protector for meters, industrial power service entrances or consumer apparatus has been announced by G-E. Rated at 0-650 volts, the new unit is available for indoor or outdoor installation on single or polyphase secondary circuits. Single-, double- or triple-pole assemblies are enclosed in compact cylindrical aluminum cases with provision either for nipple mounting through the knockout holes of meters or connection boxes or bracket mounting to building or pole. Flamenol line and ground leads extend 18 in. outside the threaded nipple. The weatherproof covering is colored for easy identification.

## Reduced Tank Height (309)

New high-voltage sidewall bushings have reduced tank height as much as 3 in. on the line of Allis-Chalmers 2,400-volt distribution transformers in the 5.0-kv. insulation class, 100 kva. and below, the manufacturer has announced. This arrangement combines simple mechanical advantages of a tank-wall, stud-type bushing and the electrical and weather protective advantages of a pocket-type bushing, it is stated.

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## *Heat Resisting Insulation*

● CRESCENT Service Cables, sizes No. 6 AWG and larger, are insulated with a Type RH, Crescent ENDURITE super-aging, heat-resisting rubber compound of the best grade obtainable that gives 20% *greater current carrying capacity* than ordinary grade insulated service cable.

● Service cable is the bottleneck limiting the amount of customer demand for all appliances, and future business for the contractors, dealers, wholesalers and power suppliers.

● With CRESCENT SERVICE CABLE you get maximum load capacity, long life and value. Made in Type SE, Style U, as shown; Style A with a galvanized steel armor tape over the bare neutral conductor, and in Type SD, Drop Cable, Sizes #12 to #2 AWG in two and three conductors.

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**CRESCENT INSULATED WIRE & CABLE CO.**

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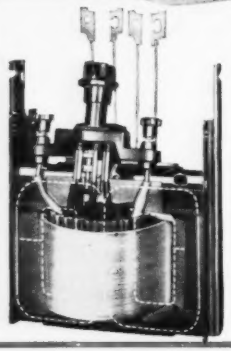
OVER 60 YEARS EXPERIENCE

# THE NEW MOLONEY HiperCore*

## DISTRIBUTION TRANSFORMERS

*CORES MADE OF HIGH PERMEABILITY, ORIENTED, SILICON STEEL

## BETTER VOLTAGE



Dotted line in illustration at left, indicate position of core in assembled core-and-coil unit. After cores are wound, they are annealed, impregnated and then cut into pairs of U-shaped pieces. Two large U-shaped pieces are placed side by side, forming an inner and two outer core legs. Then the windings are placed over the inner core leg. Next, the two matching U-shaped pieces are placed into position to complete the magnetic circuits. A thermo-setting adhesive bonds the core faces together.

### BETTER VOLTAGE REGULATION AT ALL LOADS

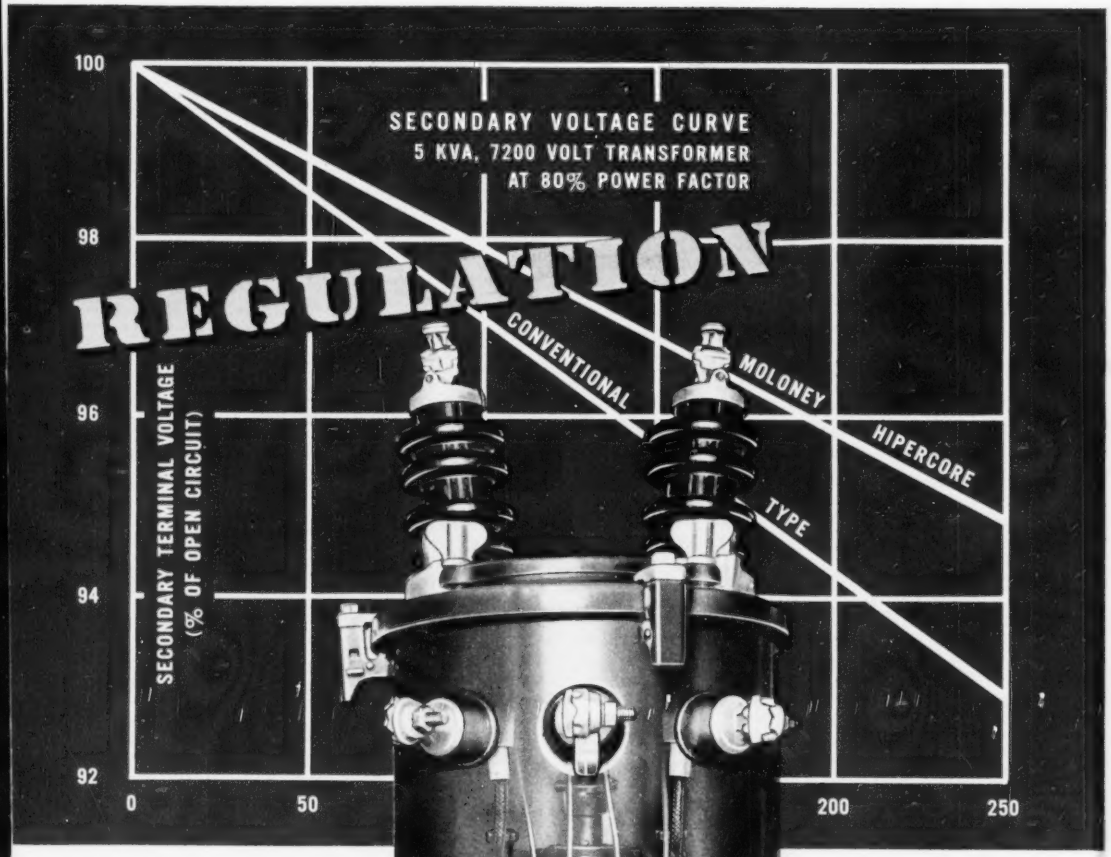
Development of the new Moloney HiperCore Transformer has made possible a reduction in transformer impedance, resulting in better voltage regulation. These wound core transformers, being smaller physically, have inherently lower impedance than transformers of conventional core design.

Better voltage regulation means better all-around system performance. Secondary voltage fluctuations, due to sudden or intermittent load changes, are reduced. Secondary voltages may be maintained at a higher level resulting in improved performance of the connected load.

In many installations emergency loading is controlled largely by transformer voltage regulation. Moloney HiperCore Distribution Transformers, having better regulation, can carry higher overloads with the same permissible voltage drop.

# MOLONEY

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT




### GREATER SHORT-TIME OVERLOAD CAPACITY

Moloney HiperCore Transformers have improved short-time overload characteristics which provide better peak load performance and longer life. Reduced coil mass, achieved through use of oriented steel cores, together with the extensive use of cooling ducts, results in more rapid cooling of the windings and in a lower hottest-spot temperature gradient.

### LIGHTER WEIGHT

The 30% to 35% higher flux carrying capacity of the oriented core steel used in HiperCore Transformers makes possible the use of smaller cores and windings, with consequent reductions in the weights of steel, copper, oil, and other materials. HiperCore Transformers weigh 15% to 30% less than transformers having cores made of hot rolled steel, making them easier to handle and install.

### SMALLER SIZE

Since the higher flux carrying capacity of oriented steel permits the use of smaller cores and windings, smaller tanks can be used. Reductions in size range up to 30%. HiperCore Transformers take up less space on the pole, in the storeroom, and on the line truck.

### SUPERIOR TAP CHANGER DESIGN

The "snap action" movement of the tap changer used on Moloney HiperCore Transformers assures positive pressure at all times. The handle is above the hot oil level and the dial can be read from the handhole opening. The body of the tap changer is made of high-impact-strength phenolic resin for high insulation and elimination of breakage. Use of high contact pressure and oversize contact surfaces insures low temperature rise and eliminates pitting or burning.

# ELECTRIC COMPANY

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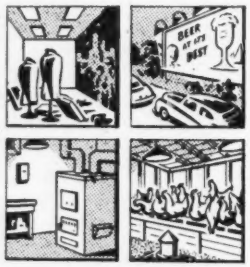


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ASTRONOMIC "FOLLOW the SUN"
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## Feature Devices from the KULKA Line

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ADJUSTABLE SWIVEL SOCKETS

In BAKELITE and PORCELAIN

- Engineered construction for long-lasting, perfect service.
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- No connecting wires exposed.

No. 160A
BAKELITE
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No. 160
PORCELAIN

Attractive, efficient swivel sockets. No. 160A made of high-heat BAKELITE, and No. 160 of superior electrical PORCELAIN. Swivel of special die-cast material. Turns any direction, yet holds firmly. Positive spring-tension center contact.

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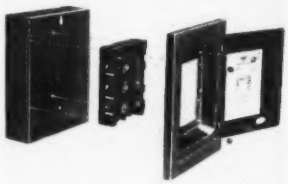
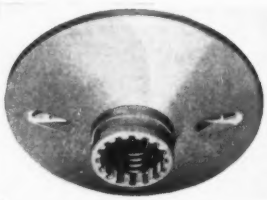
### Panels (310)



Federal Electric Products has improved 4- and 6-circuit residence panels composed of the box, Bakelite socket base and cover, and available in flush- or surface-mounting types. According to the manufacturer, removal of four hex nuts gives access to the socket block, which can be turned to bring leads into the enclosure through top or bottom. No screw heads show when one-piece front is closed. Knockouts are on sides and back. Approved by Underwriters' Laboratories.

### Ceiling Receptacle (311)



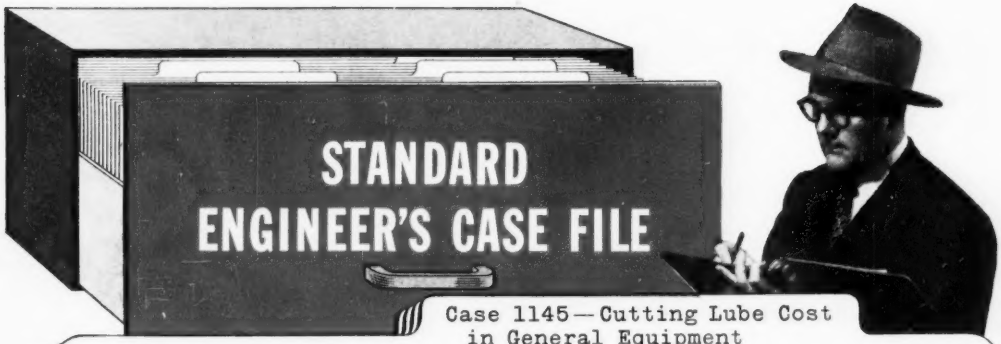
An oversized combination 3¼x4-in. keyless ceiling receptacle is being produced by Slater Electric Mfg. Co. Known as No. 277, this device measures 5 in. in diameter instead of the conventional 4 in. It is made of tough white Urea or regular brown Bakelite; has heavy terminals, solid rivets and large binding head screws suitable for No. 10 wiring, the manufacturer states. The company also makes No. 276, a smaller receptacle for combination use on either 3¼- or 4-in. boxes.

### Wire Stripper (312)

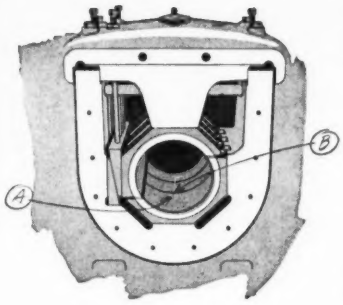
An improved hand-type, pocket-sized wire stripper, the Stripmaster, has been announced by Ideal Industries. It features an "automatic" cam action that releases the jaws for removal of wire after stripping. Squeezing the handle grips the wire, cuts the insulation and strips the wire, in one operation. Four models handle wire gages from No. 22 to No. 8; a fifth model is designed especially for FM and TV down lead wire. Blades are interchangeable on all models; may be replaced by removing two screws.

### Recorder (313)

The Running-Count recorder recently announced by the Bristol Co. plots on a circular chart a curve of number of operations against time. It records the total count of intermittent operations and the time at which each one occurs, may be used on production machinery to record work-producing operations or number of pieces produced.




## Case 1145—Cutting Lube Cost in General Equipment




AIR COMPRESSOR MAIN BEARING

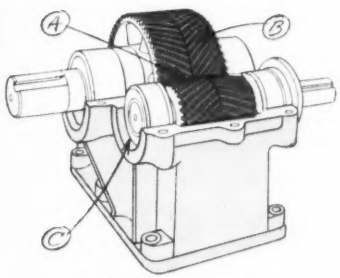
Calol Multi-Service Oils in air compressors decreased lubricant consumption as much as 20%. Highly efficient in many machines, including Diesel engines, pumps, enclosed reduction gears and their integral bearings. Come in six grades: 45X, 50X, 55X, 65X, 75X, 85X. Approximately SAE 10 to SAE 50.

A. Contain oxidation-resistant compounds ... prevent formation of varnish and lacquer on bearing surfaces, engine cylinders, pistons, etc.

B. Special compound assures lubrication at high temperatures — has inherent tendency to "run toward" hot surfaces ... spreads uniformly and rapidly.

Other additives in Calol Multi-Service Oils help remove lacquer and varnish from machine parts and keep them dispersed, and prevent excessive foaming of oil. May be used in all types of oiling systems.

## Case 1143—Preventing Scuffing and Galling of Enclosed Gears

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A. Contains extreme pressure compounds — will not pound or squeeze off . . . reduces wear, cushions shocks and promotes gear efficiency.

B. Resists oxidation, conducts heat readily and helps cool gears, bearings, etc.

C. Foam inhibitor prevents building up of pressure in gear cases and reduces leakage.

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**THE MAGNO-TRONIC FLUORESCENT STARTER**

**PROTECTS** Fully automatic thermal relay with unusually long life that eliminates blinking lights and protects all auxiliary equipment.

**SIMPLIFIES** Replacement of worn-out lamp automatically restores closed circuit—replacement of starter unnecessary. No button to push.

**REDUCES COSTS** Magno-Tronic starters provide exact timing in the lamp electrode—preheating process preventing excessive loss of emission material thereby assuring the maximum in the useful life of a lamp. The established quality of this starter saves considerable time in maintenance and man hours required to repair and/or replace an inoperative lighting unit.

**VERSATILE** Will operate efficiently over an extended voltage under widely varying temperatures.

GUARANTEED FOR ONE YEAR

The (SP-15-20) for use with either 15 or 20 watt lamps
The (SP-30-40) for use with either 30 or 40 watt lamps
The (SP-100) for use with 100 watt lamps

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MAIN PLANT Newark 2, N. J.

**STEEL STRAND**

Crapo GALVANIZED PRODUCTS

ALL the strength and durability inherent in steel are combined---with definite economies---in Crapo Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous Crapo Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of Crapo Galvanized Products near you or write direct for further information!

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**ALL KINDS**
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**—in the JEFFRIES line**

Practically all your small transformer needs are supplied by the Complete Jeffries line. We have specialized for years in providing transformer to exactly match your requirements. If not in our regular line, we build to meet your specifications in a hurry!

Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

JEFFRIES TRANSFORMER COMPANY
1710 E. 57th St. Los Angeles 11, Calif.


## Lighting Brackets (314)

Hubbard has announced a new type of street lighting bracket available in from 3 to 8 ft. long in both 1¼- and 2-in. pipe, and adaptable for either wood, steel or concrete pole mounting. The entire bracket is shipped in one piece including pole mounting facilities and end fittings.

A feature is that, after having installed a pole bolt, one man can install the bracket by slipping it over the head of the bolt using the key-hole slot provided in the upper attachment plate. Lag screw holes in lower plate give alignment. It is stated the greatest amount of rise for any given extension from the pole is offered by these brackets, which are suitable for both internal and external wiring. Pipe edges are rounded for protection to cable insulation at pole end, permitting use of the new style heavy, two-conductor street lighting cables.

Patent has been applied for on main features of the bracket.

## Insulating Varnish (315)

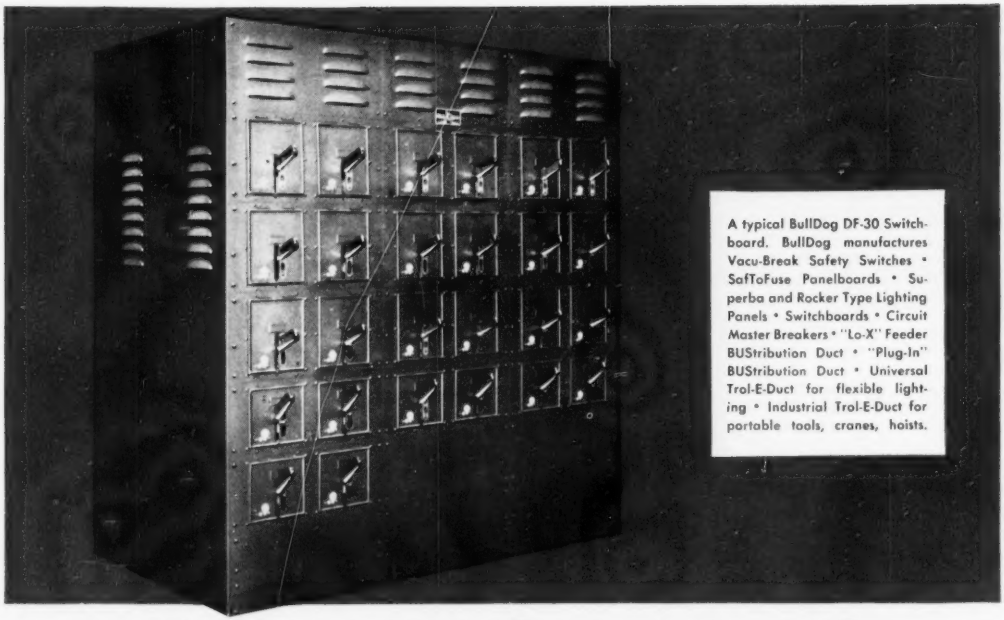
Irvington Varnish & Insulator Co. has developed an internal-curing insulating varnish which it claims produces bonding strength approximately 25% greater than previous varnishes. Known as Harvel 1012C, it was developed particularly for the impregnation of wound structures requiring the maximum in mechanical bonding strength, although it can be used as an all-purpose varnish. It is an especially fast curing resin and the cured film is absolutely oil proof, has good chemical and moisture resistance and resistance to decomposition under high-temperature operating conditions, the manufacturer states. It is also claimed that there is a desirable relationship between viscosity, gravity and solids, and in its shipping consistency the varnish will produce a film thickness of approximately .0025 in. It can be maintained at the proper consistency with VM and P naphtha.

## Baking Varnishes (316)

John C. Dolph Co. has announced Synthites BC-301 and BC-302 clear baking varnishes. The former is described as an extremely flexible and heat resisting material for insulation of transformer coils; the latter as a quick curing thermosetting varnish for insulation of all types of wound coils.

BC-301 is composed of phenol formaldehyde resin and selected drying oils; cures by polymerization; maintains a high degree of flexibility even though the film is comparatively hard when cured; may be applied by atmospheric dip or vacuum impregnation; build-up is from 5 to 5½ mils per coat with a dry dielectric strength of more than 1,500 volts per mil and a wet dielectric strength of more than 1,000 volts per mil.

BC-302 may be applied by atmospheric dip or vacuum impregnation; build-up is from 4 to 5 mils with a dry dielectric strength of more than 2,000 volts per mil and a wet dielectric strength of more than 1,300 volts per mil.



A typical BullDog DF-30 Switchboard. BullDog manufactures Vacu-Break Safety Switches • SafToFuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution Duct • "Plug-In" BUStribution Duct • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes, hoists.

# Master-control engineered to your plant problems

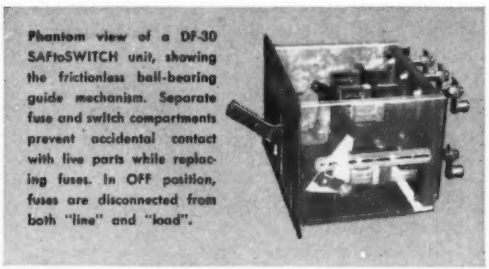
MEET the switchboard that considers both today and tomorrow in bringing you power control . . . the BullDog DF-30 type. Engineered to your present needs, it is still flexible enough to take future changes in stride.

BullDog DF-30 Engineered Switchboards are constructed compactly, but provide spare space for possible extra requirements later on. In addition, individual switch units are interchangeable, making possible quick replacements when circuit loads change.

**Switch units** in DF-30 Switchboards are the famous BullDog SAFtoSWITCH units, approved by Underwriters for all sizes from 30 to 1200 amperes inclusive, 600 volts and less.

SAFtoSWITCH units in BullDog DF-30 Switchboards have ball-bearing action, greatly reducing friction. Quick, simultaneous double-break switch action cuts dangerous arcing. In "OFF" position, both "line" and "load" are disconnected, eliminating feedbacks.

Main circuit-breaker protection, transformers and metering equipment can be built into your DF-30 Switchboard. Ask your local BullDog Engineer for full information.



Phantom view of a DF-30 SAFtoSWITCH unit, showing the frictionless ball-bearing guide mechanism. Separate fuse and switch compartments prevent accidental contact with live parts while replacing fuses. In OFF position, fuses are disconnected from both "line" and "load".

**BullDog** Field Engineers welcome the opportunity to sit in with you during the early planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation costs, as well as efficiency and reliability in actual operation. Why not take advantage of this service?

**BULLDOG ELECTRIC PRODUCTS COMPANY**
DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

**BULLDOG**

**HEADQUARTERS FOR ELECTRICAL DISTRIBUTION**

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

**Coast Electric & Manufacturing Co.**
1720 N.E. Sixth Avenue Tel. Garfield 2844
**Portland 12, Oregon**

**Safety Switchboard Company**
1445 Stevenson St. Tel. Hemlock 1-2470
**San Francisco 3, Calif.**

**Mullenbach Electrical Manufacturing Co.**
2300 East 27th Street Tel. Logan 5-5331
**Los Angeles 11, Calif.**

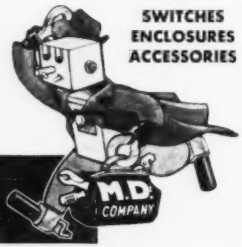
**PLASTIC COVERS**— Here are those new streamlined PLASTIC COVERS you've been hearing about. They are being shipped out as fast as they come off the molds, and you should hear some of the swell compliments we have been receiving — "Why didn't you produce these before?" — "The best change made in test switch covers," etc.

Cat. 204PF, 4½" base
Cat. 207PF, 7½" base
Cat. 209PF, 9½" base
Cat. 211PF, 11½" base
Front Connected

Cat. 204PB, 4½" base
Cat. 207PB, 7½" base
Cat. 209PB, 9½" base
Cat. 211PB, 11½" base
Back Connected

Pleasing to the eye, precision molded of heavy black Textolite, and being fully insulated, they cannot cause a short circuit when installing or removing. Specify them on your next order.

WESTERN SALES REPRESENTATIVES
FRED W. CARLSON, 307 Wall St., Seattle, Wash.
JOHN G. CORRIN, 600 S. Highland Ave., Los Angeles 36, Calif.




SWITCHES
ENCLOSURES
ACCESSORIES

**METER DEVICES**
COMPANY • CANTON, OHIO

**CUSTOM-MADE BRUSHES at NO extra cost!**

1 There's no production time wasted cutting down so-called "standard" brushes.
2 There's no "field variation" — brushes are precision-shaped at the factory.
3 There's no extra cost — you get brushes that fit your commutator and rings exactly.

The next time you need brushes, call the Helwig office near you for all the facts on how Custom-Made Brushes can cut your maintenance costs.

**DON'T RUN OUT OF BRUSHES!**

Here's a simple way to maintain your brush stock. Choose any of 8 Helwig Brush Kits. Bulletin 65 gives complete details.

PACIFIC COAST OFFICES

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|---|---|
| San Francisco | Pier 3, Exbrook 2-8820 |
| Seattle | 166 Jackson St.; Elliot 7133 |
| Portland | 711 NW Everett St.; Beacon 3368 |
| Los Angeles | 611 W. Pico Blvd.; Prospect 8381 |
| Denver | 1644 Blake St.; Cherry 4425 |
| Salt Lake City | 524 F. St.; Tel.: 3-1600 |

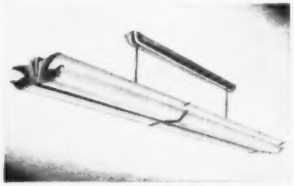
HELWIG SPEER

**HELWIG CO., Carbon Products**
Makers of Multiflex and Transert Brushes

## Lighting Control (317)

Fisher-Pierce Co. is making a new single-unit outdoor lighting control for interval night illumination, designated as Series 62405 photoelectric relay. It consists of a light-sensitive photo relay and a built-in time switch. In a typical installation an electric sign is illuminated before dusk, darkened between midnight and 6:30 a.m.; lighted again for the heavy early morning traffic; then automatically turned over to the photo relay for on and off control as needed during the remainder of the 24-hour period. Model 62405 operates on 115 volts a-c; model 62406 on 230 volts a-c; both rated to handle 3,000 watts; tubes have a life expectancy of 20,000 hours.

## Slimline Fixture (318)



Designed for a Western utility office building, Sunbeam's Visionaire is a luminous, indirect, 4-lamp, slimline fixture producing the "batwing" type of light distribution which results in high-level illumination and low surface brightness. Double parabolic reflector body is 96 in., weighs less than 20 lb. Ballast equipment is housed within the fixture canopy, permitting installation of the unit by one man. Removable panels are of plaster.

## Lamp Finish (319)

A new inside finish for incandescent lamps has been announced by General Electric. It is a silica substance said to act as a nearly perfect diffuser of light yet to permit high light transmission. It is being introduced in three bulbs, a 100-watt, a 100-200-300-watt and a 150-watt indirect-lite lamp. The new 100-watt lamp resembles 100-watt inside frosted lamps in size, shape and length of life, the manufacturer says.

## Portable Light (320)

McGill's new No. 505 is an all-purpose portable light featuring a concentrating lens said to multiply the useful light and a universal mounting which has adjustment through a full circle horizontally and 270° vertically. Additional wide-area illumination is provided by the half-round reflector.

## . . . both having 8000-RMS-ampere interrupting capacity

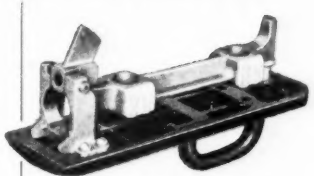
Here are two heavy-duty enclosed indicating fuse cutouts for high power capacity distribution feeders. They have interrupting ratings of 5000-rms amperes at 5000 volts (or line-to-neutral of 8330-volt grounded wye systems) and 8000-rms amperes at 2500 volts (or line-to-neutral of 4160- or 4330-volt grounded wye systems).

Cutout shown on the left is the new heavy-duty 50-ampere unit — for all who want *high interrupting capacity* without paying for unneeded high continuous current rating.

Cutout shown on the right is the standard heavy-duty 200-ampere indicating unit incorporating recent improvements in door and swivel hanger support.

Both units have housings of wet-process porcelain, glazed inside and out, with hanger support cemented into back—doors of molded Textolite, compound—and fuseholder tubes of laminated linen-base Textolite and fiber, easily replaced and with exceptional resistance to both weathering and arcs—and both have spring-operated indicator arm to pull cable downward and completely out of tube—assuring quick interruption even at low currents.

For details and prices ask for Bulletins GEA-3688 and -5019. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

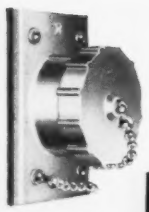


**400-AMPERE DISCONNECTING BLADE FOR 200-AMPERE CUTOUT**

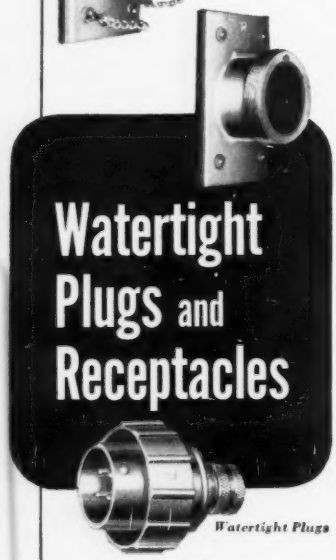
Simply by changing the door, the 200-ampere fuse cutout can be converted to a 400-ampere disconnecting cutout. This unique disconnect door can be closed, with the hinged blade in open and completely isolated position to give positive indication that the circuit is open.

GENERAL ELECTRIC

406-28



*Receptacles for FS-FD Pylet bodies*




*Watertight Plugs*

**WITH**

**TRIPLOC CONTACT UNITS**

• These substantially built plugs and receptacles are equipped with Triploc contact units and are watertight for use as floodlight connections or for any other type of portable electrical equipment where weather protection is needed. Types include 1, 2, 3, 4, 6, and 8 pole units. Receptacles are galvanized cast iron with brass cap. Plugs are cast aluminum alloy with threaded nut and rubber bushing cord grip. Female contact units can be mounted in plug shell as well as in receptacle housing, as all contact units are interchangeable and reversible. For any type of outdoor plug and receptacle connections refer to your Pylet Catalog for complete listings.

SINCE 1897

**THE PYLE-NATIONAL COMPANY**

1364 N. Kostner Avenue, Chicago 51, Illinois

Pacific Coast Sales Office
25 Beale Street, San Francisco 6, Calif.


# BULLETINS ETC.

## Switches (321)

Cole Electric Co. has published a new booklet on its outdoor and indoor power switching equipment. It has a spiral binding from which sheets may be removed; is conveniently indexed for easy reference. Illustrated.

## Transformers (322)

Transformers filled with Chlorextol, non-inflammable insulating liquid, are described in a recent bulletin from Allis-Chalmers.

## Devices (323)

Allied Electric Products and Sheldon Electric Co. have published a fifteenth anniversary catalog covering electrical devices and lighting items.

## Garbage Disposer (324)

A manual of instructions for installing the Mullinaider electric garbage disposer has been issued by Mullins Mfg. Corp.

## Lighting Units (325)

Benjamin Shield-Flo units are described in Bulletin AD 5428 available from that company.

## Generators (326)

Kato Engineering Co. is offering a catalog sheet on Katolight switchboardless generators.

## Lighting (327)

"Wiremold Aids to Better Lighting" is the title of a pamphlet issued by that company and illustrating and describing its line of fluorescent equipment.

## Load Centers (328)

"How Power at Load Centers Pays Off" is the title of Bulletin 11B6285A issued by Allis-Chalmers.

## Instruments (329)

Taylor Instrument Co. has prepared a revised edition of "Taylor Guide to Correct Instrument Selection." This booklet covers the companies line, gives application field principle of operation and range limits for each type of instrument.

## Lighting Data (330)

Fleur-O-Lier is offering a booklet describing an index system for specifying lighting performance and for rating fluorescent lighting fixtures.

## Dimmers (331)

Ward Leonard Vitrohm dimmers of the interlocking and non-interlocking types are described in Bulletins 71 and 72, recently issued.

## Regulator (332)

Westinghouse tells about its rotating regulator, the Rototrol in a new 22-page booklet. Illustrated.

## Church Lighting (333)

A church lighting catalog is available from Edwin F. Guth Co.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

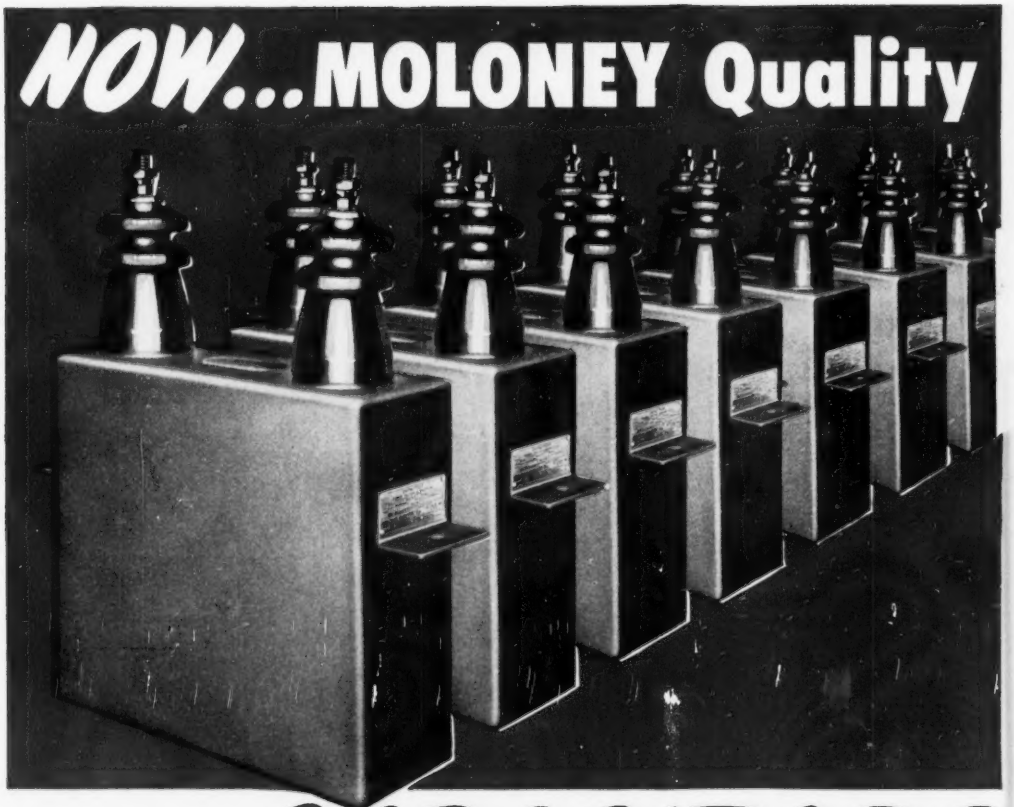
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 |
| 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 |
| 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 |
| 327 | 328 | 329 | 330 | 331 | 332 | 333 | | |

Name ..... Company* ..... Title* .....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

# NOW...MOLONEY Quality



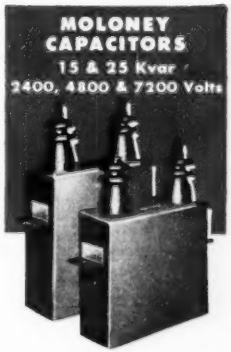
# ...in CAPACITORS

*Yes...* now you can use Moloney Shunt Capacitors for correcting low power factor conditions. And you can be certain that these capacitors are built to the same traditionally high standards to which Moloney Transformers have been built for over 50 years.

Moloney Capacitors are carefully made to insure long life and trouble-free service. Only the very highest grade materials are used. Individual capacitor packs are tested before assembly. Thorough final tests are given capacitors after completion.

Install Moloney Capacitors for reducing reactive Kva . . . to permit more efficient use of generator, transformer, and feeder line capacity . . . to reduce system losses . . . and to improve voltage regulation.

Standard ratings are available from stock.




**MOLONEY ELECTRIC COMPANY**

*Sales offices in all principal cities*

FACTORIES AT ST. LOUIS 20, MO., AND TORONTO, ONTARIO, CANADA

# ELECTRA'S HUSBAND

## WHAT PRICE AUTHORITIES?

"IF your dinner is late, blame the streetcars," Electra said testily one evening recently. "It took me forty minutes to get home from down town instead of fifteen. No city in the country has worse streetcar service."

"Don't gripe too much," I countered. "What with the traffic congestion it took me twice as long to drive home."

"What's the city going to do about it? Electra asked. "Is there any possibility that a transportation authority for the whole area might help speed things up so that traffic moves? The worse the streetcar service gets, the more people that drive their cars down town and the worse traffic snarls up in rush hours."

"Well a transportation authority might be the answer," I said. "However, a good dose of the kind of management and discipline a private company receives would do a lot of good for the street railway. Besides I don't relish the idea of these so-called authorities. One is suggested for transit facilities for all of the cities around the bay and another is proposed to take over the harbor. But the one that worries me most is the Columbia Valley Authority up in the Northwest. Next step would be a Central Valley Authority and then a Colorado River Authority . . ."

"So what?" Electra interrupted.

"Just that when you talk about authorities you want to be certain that you know whereof you speak," I continued.

"You wouldn't infer that I'm dumb," she said icily. "What do you know about them?"

"You aren't dumb and I've read a lot on the subject," I said. "An authority is a governmental business corporation set up outside of the normal structure of traditional government, usually for the construction or operation of a self-supporting or revenue-producing public enterprise. It can engage in business without consulting others or getting a lot of approvals. It is ordinarily tax exempt and it is free from interference or supervision by normal governmental regulatory officials or laws. It isn't controlled by annual appropriations and it doesn't have to submit a budget for approval. It fixes its own salaries and wages, sets up its own personnel rules and accounting system, fixes its own rates and prices for service. And it may issue its own securities backed only by its own enterprise."

"Some of that sounds all right," Electra mused. "Maybe I ought to set up an authority here at home."

"You already have one," I said under my breath and then continued audibly. "There are notable and notorious authorities. The New York Port Authority is a notably good example. It has been run by local business men appointed by the New York and New Jersey governors. The Tennessee Valley Authority is at the other end of the scale. It has been run as an autocracy by socialistic zealots appointed by the President. The CVA is to be patterned after it. So would any other regional authorities.

"An authority does not have the checks and balances that go with a democratic form of government. Its acts are not subject to review or modification by any other public body. In the case of the TVA and CVA the authority has virtual dictatorial control over the economy of an area. It can and may assume control over the lives, property and time-honored customs of a region. It is a stepping stone to complete regimentation of industry and business. It is a form of state paternalism that ought to be obnoxious to every freedom-loving American."

"What are you doing, making a speech?" Electra asked. "You don't have to get my vote."

"Forgive me," I said. "I just get burned at the way our people supinely let the bureaucrats have their own way. So far as I can learn there isn't a corporal's guard in the Northwest in favor of a Columbia Valley Authority. Some liberal labor people, a few politicians and the radical farm groups are the vocal proponents. So the powers-that-be in Washington are going to impose an economic dictatorship on the region whether or not it is wanted or necessary. Apparently no investigation will be made of the sentiment of the people of the Northwest. If such an investigation was made, the results probably would surprise and embarrass the bureaucrats who are fostering the program. I'll wager that most of the people up there would view an authority of that type as an unnecessary encroachment on their rights.

"The Northwest has been developed by an enterprising and pioneering people who by tradition have been taught to look after their own welfare. The area has grown and developed faster than almost any other comparable section of the country without federal paternalism. It isn't like the Tennessee Valley.

"The TVA which was set up for certain basic purposes in that area, took a limited grant of authority and fashioned a huge empire for itself. It demonstrates how an authority can be perverted to achieve whatever ends those charged with its administration may desire. The primary purpose of the TVA was to harness the Tennessee River and its tributaries to promote navigation and control floods. In the construction of dams and reservoirs, it was obvious that by-product electric power would be available. The act creating the TVA authorized it to transmit and sell surplus energy over and above its requirements with the idea that such sales might help in liquidating the cost of the dams and reservoirs. From this beginning TVA has extended its operations to a point where it is the sole producer of power for all but a small corner of Tennessee and for parts of six other states, a total area of 80,000 square miles.

"You can call it big business too. Its assets as set forth in its last report were listed at $887,920,722. Of that amount appropriations of taxpayers' money by Congress totaled $736,223,270. It had paid back a paltry $31,000,000.

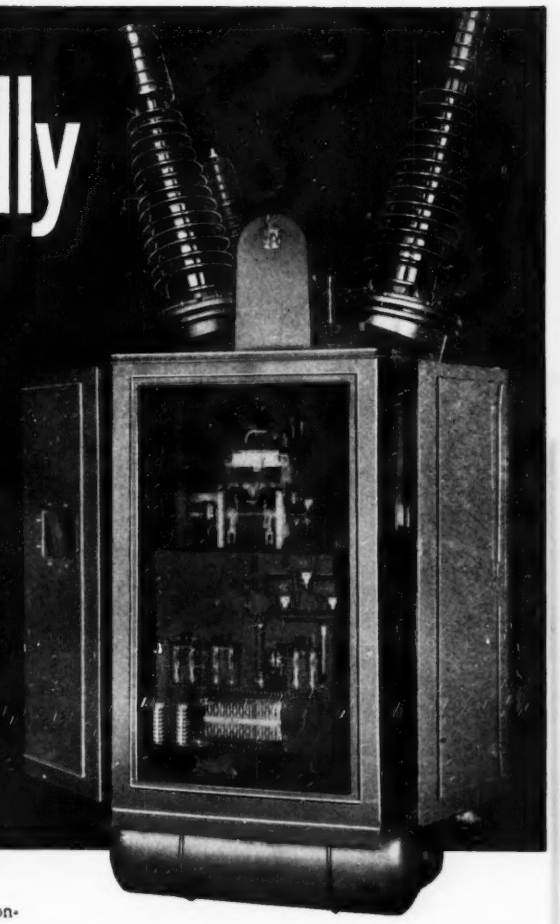
"These authority propositions, as TVA demonstrates, are simply moves to make big government bigger and remove it farther from the people."

# Mechanically Trip-Free

## PNEUMATIC OPERATOR

**MEANS BEST PROTECTION FOR YOUR EQUIPMENT**

**INSTANT BREAKER OPERATION UNDER ALL FAULT CONDITIONS**



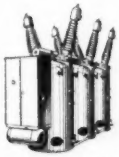
MECHANICALLY TRIP-FREE action instantly releases contacts from closing force when closed on a fault . . . permits high contact acceleration unhindered by closing cylinder back-pressure or toggle inertia. You get instant, complete contact opening under all tripping conditions.

With this powerful Allis-Chalmers electro-pneumatic operator, highest possible system stability and service continuity are maintained. The breaker cannot be held closed on a fault . . . and operator mechanism is quickly recoupled to permit fast reclosing—within 20 cycles. Pneumatic operation furnishes reliable, high-speed contact closing economically — requires only fractional horsepower motor.

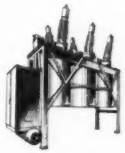
This *mechanically trip-free* electro-pneumatic operator is just one of many features you get on Allis-Chalmers oil circuit breakers. For details on any rating, contact your nearby A-C representative. Or write direct. A 2625

ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

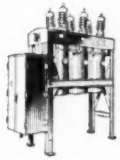
**IT'S STANDARD EQUIPMENT ON THESE ALLIS-CHALMERS OIL CIRCUIT BREAKERS**



**TYPE BZO-160** . . . 69 to 230 kv — 3- or 5-cycle opening, 20-cycle reclosing



**TYPE FZO-151** . . . 69 kv . . . frame-mounted—5- or 8-cycle opening, 20-cycle reclosing.



**TYPE FZO-150** . . . 15 to 46 kv. —8-cycle opening, 20-cycle reclosing.

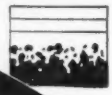
# ALLIS-CHALMERS

**Pioneers in Power and Electrical Equipment from Generation through Utilization**

# Obtain HIGH lighting efficiency at LOW maintenance cost

"TURNLOX"* permits detachment of reflector and lamp as one unit.

"SEALED BEAD" CONSTRUCTION resists corrosion.



BENJAMIN LIFETIME PORCELAIN ENAMEL . . . easiest-to-clean . . . increases light output.

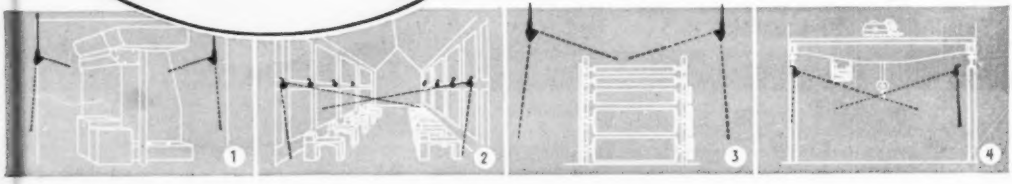
TYPICAL LOCATIONS WHERE ELLIPTICAL ANGLE UNITS ARE RECOMMENDED

1 Tall machinery obscures overhead lights from vision.

2 Ceilings too high, need effective light from the side.

3 Must have light on vertical surfaces, such as presses.

4 Overhead obstructions make overhead lighting impractical.




## Approved by the most modern industrial lighting practice for many locations!

Thousands of Industrial lighting problems are solved satisfactorily and economically by specifying Benjamin Elliptical Angle Units.

These Porcelain Enamel Units are especially designed for the lighting of many locations, commonly found in industry, where overhead illumination is difficult or impractical due to structural obstructions.

*Also available with SOCKET-REFLECTOR, featuring separable "X" type fitting which allows reflector to be slipped back over conduit.

Outstanding design and construction features contribute to uniform, diffused illumination on both horizontal and vertical working surfaces while shielding the workers' eyes from direct lamp glare.

**FREE DATA BULLETIN AVAILABLE** giving complete details on a wide size range of Benjamin Elliptical Angle Units (75 watt to 750–1500 watt). Write: **BENJAMIN ELECTRIC MFG. CO., Dept. J., Des Plaines, Ill.**

"TURN-LOX" BENJAMIN Elliptical Angle PORCELAIN ENAMEL LIGHTING UNITS

G-30505

DISTRIBUTED EXCLUSIVELY THROUGH ELECTRICAL WHOLESALERS

MARCH 1949 Vol. 102, No. 3

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

## FOR THE NEXT FOUR YEARS...

# Public Relations vs. Public Ownership

Alfred M. Cooper

DURING the next four years the question of whether electric public utilities will operate predominantly under private or governmental ownership will be decided for generations to come. On the one hand, politicians have discovered in the divided utility ownership situation a method of securing votes from an electorate that is either partially informed or wholly uninformed, and may be expected to make every effort to capitalize on a problem that should be solved solely on its economic merits. Conversely, the management of our privately owned electric utilities, having successfully survived 16 years of concerted efforts to socialize their industry, may be expected to continue the fight against government ownership of all our utilities.

It is unfortunate that the leadership of American industry has not as yet generally come to recognize the utility ownership question as directly affecting the future of all private enterprise in this country. Watching Great Britain, we see clearly what happens to a people who temporize with any phase of state socialism. In America, too, it may be truthfully said that, as the utilities go, so goes all American industry.

Those who favor socialization of industry always have found the governmental bureau the ideal cover from which to operate. These leftist economists and politicians are convinced that John Doe can distinguish little difference between government operation of our postal service and federal ownership of our electric utilities, and eventually of our railways, communications system and factories.

Against the powerful and excellently coordinated efforts of the advocates of drastic social and economic reform within our midst, the management of the electric utility company possesses but a single weapon of defense. Properly utilized, however, this armament —good public relations—can and will defeat every move of the politician and revolutionary intended to overthrow our existing method of getting things done under the free enterprise system.

If ever there was a time when the public relations setup of any power company should receive the most careful and searching scrutiny, this is that time. It is equally important that utility people learn to recognize and evaluate the four primary factors which go to make up favorable public attitude, and thereby to measure accurately the efficacy of their own efforts to win the strongest public favor. Public relations always has decided, and always will decide, ownership elections.

1. The power company should first measure the physical service it renders to the consumer in terms of (a) continuity of that service, (b) willingness of the company to extend facilities to areas that cannot prove immediately profitable, and (c) voltage at the service outlet.

The outstanding factor to be borne in mind in connection with physical service offered by the utility is that it is the opinion held by the consumer regarding this service that is of paramount importance, and this opinion may not always jibe with the facts. As every utility executive knows, a powerful bureaucracy is working tirelessly to persuade Americans generally, and particularly the American workingman and the farmer, that furnishing electric power to any community is essentially a job to be undertaken by government. The publicity of this opposition is not always factual, and it makes a strong appeal to class prejudice.

Once utility management is satisfied that the physical service rendered by the power company is of the highest order, it must then determine the degree to which its consumers are satisfied with this physical service. There is only one method of making an accurate evaluation of the consumer's opinion of the company's physical service, and that is through the medium of the public attitude survey.

It is not accidental that governmental agencies are at present exerting every effort to capitalize on the unfortunate *contretemps* of the various poll-taking organizations previous to the fall election of 1948. However, when we recollect that these polls have in the past year shown a large majority of the citizens of the United States to be (a) strongly opposed to peacetime price controls, (b) unfavorable to the proposed repeal of the Taft-Hartley Law, and (c) in favor of continued investigation of Communist activities in the United States, it is not surprising that an ultra-liberal governmental clique should abhor public opinion polls. It is also understandable that such polls, honestly conducted, would not be tolerated for a moment in any police state.

The surprising thing, however, is that industrial executives, rightly indignant at the negligence of the poll-takers who attempted to forecast the results of the 1948 elections, in many instances have aided the exponents of public power by joining in the organized smear of the opinion poll.

Utility management in particular should move slowly in condemning

properly conducted "polls" or surveys of public attitude. This is true because, as is not generally known, the opinion poll originated within a group of power companies as a device for measuring public attitude toward these utilities. The method of random sampling, as practiced by Gallup, Roper and others, was developed and first applied by J. David Houser and Associates when this organization, in the 1920s, served as management consultants to the Midwest chain of Insull utilities.

Anyone experienced in conducting surveys of public attitude will understand wherein the various opinion polls went wrong in forecasting the results of the 1948 election. The error was solely one of technique employed with respect to this particular survey, and the resultant misrepresentation could well have been accidental. Whatever the situation in this respect, it is a serious mistake to condemn categorically the method of random sampling which has been successfully utilized in public utility organizations for more than 20 years as a means of evaluating the public's attitude toward that utility. In the future, the opinion pollsters will not repeat the technical error, or errors, committed in 1948, and poll results once more will accurately depict public attitude on many questions, including the choice of political candidates at future elections. In this fast-moving world of ours America needs and must have the services of opinion polls in which it can place implicit confidence, and these surveys must never be under the control of governmental agencies.

2. With physical service rating close to perfection in the opinion of the consumer (and in this day of near-perfect machinery and equipment, this goal should not be difficult of attainment) utility management must next examine the quality of personal service rendered by its employees to the consumer. This matter of personal service ranks next in importance to physical service in determining public attitude toward any utility.

In certain power companies, personal service of the employee is today the weakest link in its defensive armor against the attacks of proponents of socialization. Much of any existing mediocre public contacting on the part of utility employees is a holdover from wartime conditions, when so many workers, in restaurants, mercantile establishments, and other commercial organizations, appeared to consider it a matter of pride to "put the customer in his place." For some reason, too little effort has been exerted in postwar years to upgrade the public contact employee of such concerns, and of utilities, both publicly and privately owned, in the elements of creating good public relations through friendly, interested and courteous personal service.

Much can be accomplished by careful training of public contact employees in methods of meeting the public. The training department of any public utility corporation should have no difficulty in instituting an effective program of such training. So long as the instructors avoid painful, accusatorial harangues on this subject, and instead permit the employee groups to develop, through discussion, improved methods of contacting the public, steady improvement in the utility's public relations will be noted.

A contributing factor to poor personal service on the part of the employee is, of course, the "phony" labor shortage which appears to exist in an era when the individual worker is often encouraged, by some agency outside his company, to slow down in production. However, it is noticeable that when management definitely insists upon high-grade performance from public contact employees, this type of service can be, and is even now being, attained.

Another factor in this matter of developing good personal service is recognition of the fact that *all* utility employees are in a very real sense public contact employees. Whether or not an overhead lineman ever directly contacts a citizen during working hours, sooner or later he will be called upon to explain, and often to defend and justify, policies and actions of his management which interest his friends and neighbors. It is vitally important that this lineman be constantly informed of such matters to an extent heretofore often considered unnecessary.

Under such circumstances, if the lineman has the facts, he will pass these on to other citizens after working hours; if he has no facts he will invent some interesting and dramatic policies of management that might well astound and disturb his superiors, if they could hear their policies thus interpreted. Citizens pay far more attention to casual word-of-mouth publicity emanating from company employees than to any formal efforts at publicizing management's viewpoint through customary media.

3. Rates charged for electric service rank third in importance among the factors which determine public attitude toward any utility. Considering the indisputable fact, so ably presented in the publicity of all utilities—either privately or publicly owned—that electric rates have remained low while other commodities and services have more than doubled in price, this may appear to be a surprising situation.

There are two principal reasons why rates continue to be important factors in determining the public relations of both power companies and governmental power bureaus—and thereby continue to affect the outcome of ownership elections.

The first of these is the belief which has become fixed in the minds of so many of our citizens to the effect that government somehow can furnish electric power to the consumer more cheaply than can any corporation operating under private enterprise. Part of this reaction is due to the intensive publicity along these lines indulged in by politicians and governmental agencies (federal and municipal) over a period of more than 50 years. The remainder of this attitude is based on the simple fact that publicly owned electric utilities too often have taken the lead in slashing electric rates.

To the man on the street the fact that a publicly owned utility can cut rates with no concern regarding its costs of generating and distributing electricity is a matter of little importance. It is also at times difficult to convince this man that he must make up in increased taxes any losses thus incurred by public power authorities.

Despite the fact that the governmental power bureau pays no taxes and can at will dip into public funds to make up for operating losses, it is yet true that electric power can be generated and distributed much more cheaply by private power companies, and every executive in the employ of a governmental power bureau knows this to be a fact. It is also true that, under private enterprise, a power company can do these things more cheaply than can any governmental agency and yet continue to pay taxes, a reasonable profit to its stockholders, and top wages to its employees. The knowledge of this fact is most discouraging to those who favor socialization, not only of our electric power industry, but of all American industry.

Power companies and their associations constantly emphasize the low cost of electricity in their publicity. But publicly owned utilities contend that it is alone their competition which keeps the cost of electric power down, and it is unfortunately true that the power company has too often merely followed suit in lowering its rates rather than initiating such rate cuts.

Considering the citizens' pained reaction to augmented tax rates in every branch of government, local and federal, and fairly evaluating the difficulties of getting out production of any sort under the genuine handicap of utilizing the cumbersome and costly civil service system of employment, it may be that the power company of the future can more often take the lead

in the matter of instituting rate cuts. In this manner existing governmental competition can be deprived of one of its strongest arguments for continued existence, and at the same time the creation of enormously costly proposed public power projects will be definitely discouraged at the polls.

The power company has done much to minimize rates as a factor in influencing public attitude. Some attention given to the two suggestions submitted herewith will detremine quickly whether or not these situations exist in the case of a particular utility.

4. Formal publicity effort, of the accepted types, including newspaper editorial and advertising space, radio, motion pictures, billboards, stuffers, platform speakers, and handbills, has in the past too often been overestimated as a factor in influencing public attitude toward the electric utility.

The plain truth is that one bad public contact on the part of a utility employee, failure to furnish electric service to an isolated rural area, or a single instance of apparent discrimination, and a week's labor on the part of the utility's publicity department can very well go for naught.

Nevertheless, it is also a fact that the private utility's publicity efforts are becoming increasingly effective, and when the three predominant factors (physical service, personal service and rates) are all that could be desired, this publicity may well become the decisive element in the outcome of a hotly contested ownership election.

The increase by utility associations in the purchase of radio time is most encouraging, particularly when we examine the influence exerted by federally sponsored radio programs on the outcome of the 1948 presidential election. Anyone who has listened to the daily coast-to-coast broadcasts of representatives of a dozen different federal agencies will have no difficulty in understanding at least one reason why the rural vote, in surprising degree, favored the sponsors of these programs. Those governmental employees who produce the news-and-agricultural information programs beamed daily at the farmers of the nation are skilled at mixing soil conservation, animal husbandry, and effective political propaganda, all pleasantly packaged in a half-hour sweetened with some good music and friendly chit-chat.

The extent to which the power company serving rural areas would be justified in attempting to match this 24-hour propaganda effort of the governmental agencies, is, of course, debatable. Nevertheless, it is a fact that governmental agencies whose legitimate functions have nothing to do with the advocacy of public power are busily attempting to sell rural radio listeners on an entire program of planned economy. Unless some effort is made to meet this indirect propaganda in favor of socialization, private enterprise generally, and the power company in particular, will continue to suffer because of it.

It then becomes evident that publicity, as it affects public opinion, may in instances determine the future of the utility ownership situation, and that radio news analysis, biased in favor of the advocates of socialization, is at present detrimental to the cause of private ownership of these utilities.

On the other hand, it continues to be true that physical service, personal service, and rates outrank publicity as factors influencing the utility's public relations. This has been amply proved during the years when the power company has been under unceasing attack from powerful radical elements, yet has continued to prosper because of superior physical service, outstanding personal service of the employees, and a rate structure that is in the main equitable and which is maintained in spite of augmented costs of labor and materials, and taxes obviously designed to cripple the privately owned utility.

In the years immediately ahead the management of any utility corporation will do well to scrutinize carefully its existing public relations setup, and to take such steps as may become necessary to improve the attitude of its consumers and the public toward the power company in particular, and the free enterprise system generally.

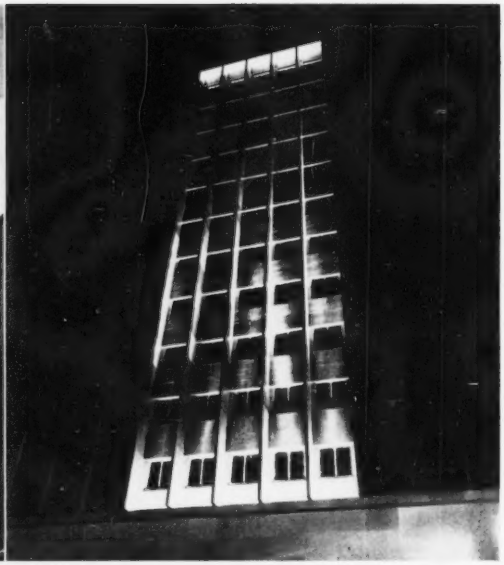
## Airport Relighted

Because of treacherous flying conditions, the Salt Lake City area has been referred to as the "hot spot." An improvement program recently completed by city, state and federal airport officials has made the city's municipal airport one of the finest in the country. The program included a 1,200-ft. extension to the main N/S instrument runway, and installation of Line Material-Bartow controllable-beam high-intensity lights, a new taxiway, apron and auto parking facilities.

The lighting unit steel shell contains two half sphere lenses, an inner fresnel and an outer refractor, and a socket mounted on wheels, which runs forward and backward on a track. This forward and backward movement is accomplished by a synchronous inductor-type motor which drives a worm gear, to which the socket is attached. Each motor in each unit is operated simultaneously and is synchronized remotely by actuating a single control lever, located on a control panel in the airport control tower. A 500-watt projection-type lamp is used, producing two identical 180,000 beamed candlepower beams, one in each direction longitudinal to the center line of the runway. The vertical angle of the beam ordinarily is set at 3° to correspond to the glidepath of the typical instrument landing system.

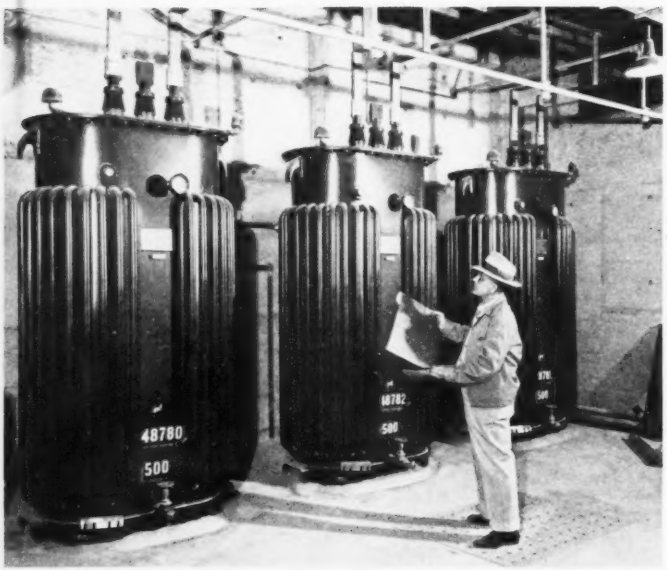
Movement of the lamps forward or backward within the lenses causes the beams to move toward or away from the center line of the runway, which enables the tower operator to use different horizontal toe-in settings for different visibility conditons. The less the visibility the more toe-in is necessary to get maximum penetration without glare. The Salt Lake City airport employs a multiple distribution system of 2,400 volts stepped down to 110 volts in the lighting units, with five stages of brightness control. One 5-kva. transformer is used to reduce voltage to 110 in nine or ten lights as spacing demands.

New General Petroleum building in Los Angeles, the largest office building in southern California, is electrically and architecturally distinctive. Light and power are both distributed at 480 volts, which effected a saving of 20%.



Night view of test floodlighting in three bays taken before adjustments had been made. If sealed-beam headlight innovation proves successful, all three faces of General Petroleum building will be floodlighted in this manner

# 480-volt Distribution Saves 20 per cent in




FOUR hundred and eighty volt distribution for power and lighting, appearing for the second time in West Coast office building wiring practice, effected an estimated saving of 20% in the new General Petroleum building in Los Angeles. This 13-story, 504,000-sq. ft. building here pictured is an immense building—the largest private office building in southern California. Its vertical aluminum fins have a utilitarian purpose as well as giving the building the effect of greater height and making it architecturally distinctive. They reflect the rays of the sun and reduce the air conditioning load. The building is structurally unique also, in that it is of light-steel construction made pos-

One of two 1,500-kva., 4,800/480-volt light and power transformer banks in basement vault is shown at left. Switchboard (opposite) contains oil circuit breakers for automatic transfer of load to second 4,800-volt primary cable in case of trouble. Vault also contains transformers for ground floor tenants

Bus duct risers at 6th floor, one for power and two for lighting, are shown at left. Center view shows tap to dry-type load center. Right, the same 600-kva., 480/120/208-volt lighting transformer bank showing to the left feeder panel serving three floors. Load centers may be paralleled with tie breakers

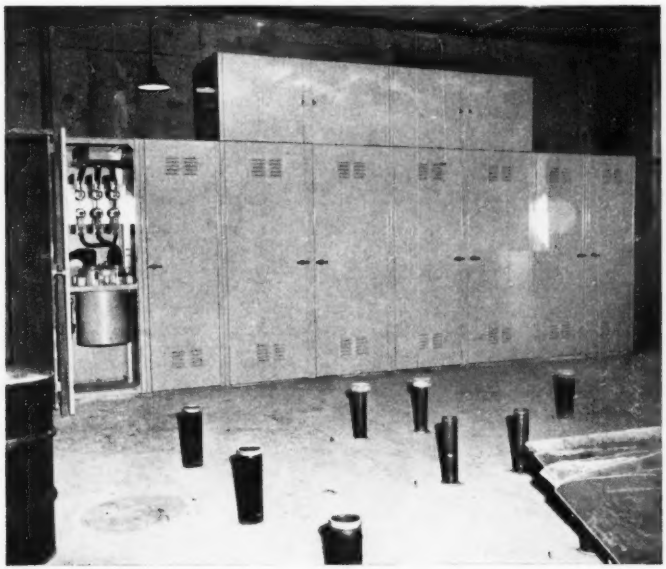
# New Building

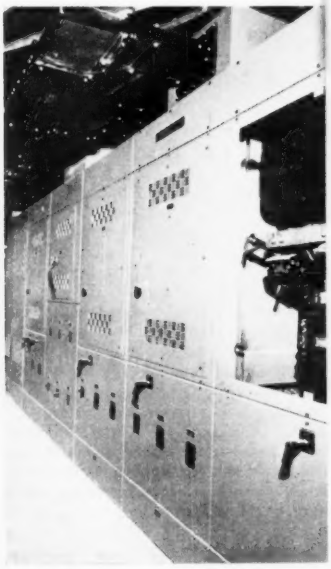
sible by use of light-weight concrete.

Use of 480-volt lighting and power feeders effected the large saving mentioned, over conventional systems of office building wiring. This is the second Los Angeles building to use 480 volts. The other is the new Prudential building. (ELECTRICAL WEST, January 1949, page 66). Ralph E. Phillips was electrical and mechanical consulting engineer on both.

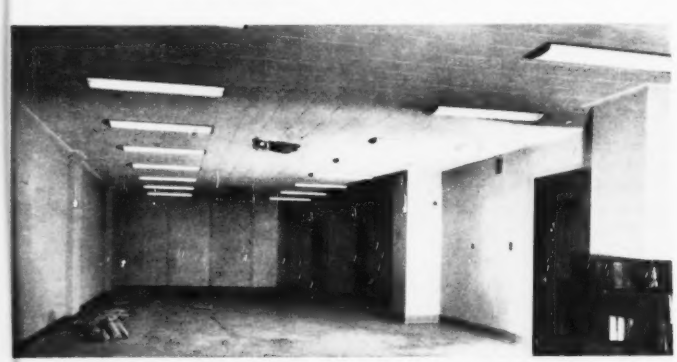
Absence of numerous heavy bus duct or conduit feeder runs is conspicuous. Instead, there is only a single

Main switchboard in basement from which 480-volt bus duct feeders distribute light and power to building. Feeders serve dry-type load centers





1,600-amp. low-reactance Square D feeder bus duct riser for power and two similar 2,000-amp. buses for lighting. The 480-volt 3-phase power riser feeds elevators and fans in connection with the air conditioning system on the roof. The two 480-volt, 3-phase lighting risers feed dry-type load centers on the 3rd, 6th, 9th and 12th floors. One bus feeds the banks on the 3rd and 9th floors; the other the 6th and 12th. Each bank serves the floor on which it is located and the one above and the one below. Each of the 600-kva. transformer banks is protected on the primary side by an 800-amp. air breaker. A 120-208-volt, 3-phase, 4-wire secondary bus feeds a breaker-type board from which emanate the several lighting panelboard feeds. Each floor has four 120/208-volt feeders to lighting panelboards



**Typical office lighting consisting of three-tube recessed fluorescent fixtures with prismatic glass covers. Average sustained intensity of lighting is 35 foot-candles**

located in the four corner areas of the building. Between each group of three floors fed from a load center there is a 120/208-volt bus tie breaker so that load centers may be taken out of service or a bank may feed more than its nominal three floors in an emergency. Also, bus tie breakers may all be closed and the system operated as a vertical secondary network, if desired.

The Los Angeles Department of Water & Power serves the building at 4,800 volts with two primary cables from separate sources. In case of failure of the preferred source, provision is made for automatic throw-over to the other source. Main and transfer oil circuit breakers are of 60,000-kva. interrupting capacity furnished by the Kelman Electric Mfg. Co. There is a bank of three 500-kva. transformers for power and another 500-kva. bank for lighting. Low-reactance secondary lighting and power buses run through a wall to the main switchboard in an adjoining room. From this board there are, in addition to the vertical bus risers mentioned, a power bus to refrigeration compressors and other motors in the basement, and a lighting bus for a 150-kva. basement dry-type transformer bank.

Besides the two transformer banks for the building, there are two other smaller banks for ground floor tenants' lighting and power. Conventional 240 volts three phase for power, and 120/240 volts single phase for lighting are supplied from these banks. Switchboards and panelboards throughout the building were supplied by the Westinghouse Electric Corp. Electrical Contractor was C. C. Jones.

### Lighting, Special Features

Standard office areas of 14x21 ft. with 8 ft. 10½ in. ceilings are lighted by four Sunbeam 3-tube, type F 40-watt fluorescent recessed fixtures fitted with Holophane prismatic Controlenses. Average intensity is about 35 f-c. A number of special lighting fixtures throughout the building were supplied by the Solar Lighting Fixture Co. The exterior floodlighting system is of special interest. The plan is to light the long vertical aluminum fins mentioned by using three sealed-beam automobile headlights mounted on a bottom ledge. The three of these lights of about 100 watts each, in each bay, will be fed by a single 120/6½-volt transformer. At the time of this writing only an initial trial installation in three bays had been made to determine the practicability of the innovation. If successful, its designers feel that it may open up an entirely new field in floodlighting.

The General Petroleum Corp. prides itself in having provided in its new building the last word in features that will make for efficiency and employee comfort. As mentioned, the building is completely air conditioned. The system has a number of interesting features. Four individual fan rooms with heat exchanger coils are located on each floor. This permits air conditioning each quarter of a floor independently of the rest of the floor or the building as a whole—a big advantage where certain departments may have to work at night. In addition, offices within these quarter-floor areas are individually thermostatically controlled. It is an interesting fact that operating costs will be less with the four fan rooms per floor than with a single large fan room. This is because it takes less power to blow small volumes of air over short distances than to blow a large volume over greater distances. On the roof of the building there is a large cooling tower hidden from the street by large metal surfaces that will mount the Mobil trade mark in neon sign.

There is a very complete public address system throughout the building. This may be used for Musak program service, AM and FM radio, or an official may cut in at any time for an announcement or special message. Coaxial cables have been installed for television, also. On the second floor there is a large auditorium with stage, sound and projection room, special walls for displays and other facilities to handle all types of meetings.

Two years of thought went into the design of the building by General Petroleum personnel. Between offices, Hauserman movable steel partitions were used. With these it is a simple and inexpensive job to rearrange office space. Prefabricated wardrobe and washbasin closets are arranged for easy removal by simply capping over the plumbing.

All convenience outlets are mounted in 3-channel National Electric Products underfloor duct. The center raceway is for a-c service and on either side is one for telephone and one for sound, signal and intercommunication building services. Outlets in the floor duct are on 24-in. centers and duct runs are 7 ft. apart.

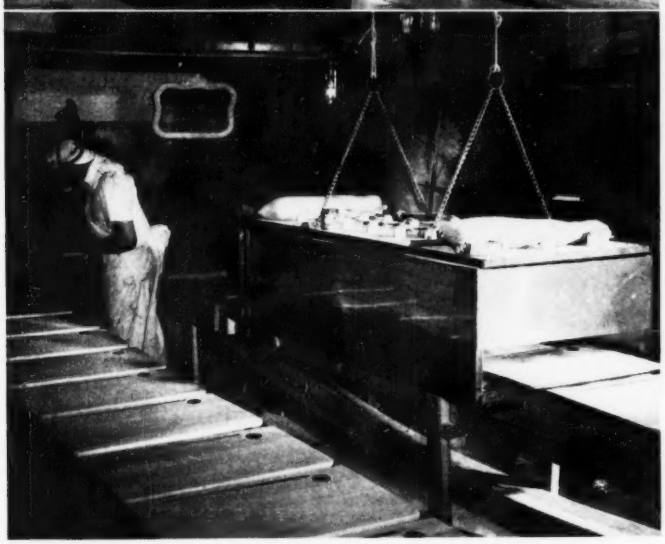
Special attention was given to facilities for handling mail and for dispatching interoffice material. For these a large dumb waiter runs the height of the building. This is provided with several features, including memory calling and time delay to prevent someone from getting the cage before a call is completed. A thoughtfully designed mail room that would handle a city of 25,000 and a spacious and well laid out photographic department are among other interesting features.

The new General Petroleum building is indeed a credit to its owners, the architect, the electrical and mechanical consultant, the electrical contractor and the community.

# NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

## *Utilization Data Sheet No. 51*

SUBJECT: Infrared Paint Drying
CUSTOMER: Spokane School District No. 81
SERVICE COMPANY: The Washington Water Power Co.
PREPARED BY: Edwin M. Atwood, Industrial Sales Engineer



Approximately 5,000 desk tops are refinished each year by the Spokane School District No. 81. Following sanding and spraying, the desks were formerly placed in racks for air drying which required at least 12 hours. During this period air-borne dust particles would stick to the drying surface, resulting in an inferior finish.

### Infrared Tunnel

To decrease drying time, an infrared tunnel was devised. This tunnel is 28 in. wide, 72 in. long and 20 in. high. As shown the lamps can be raised or lowered to permit varying the distance above the work and to facilitate servicing the lamps. Eighteen 250-watt, reflector-type lamps are installed with six additional sockets provided so the tunnel can be used for drying other articles. A 1-hp. blower exhausts fumes from the tunnel to the outside of the building.

The sanded tops are placed on a conveyor belt and sent to the spray booth. After spraying, they are transferred to a U-shaped conveyor, the first side of which includes the tunnel where the tops pass through 8 in. below the lamps. One man handles the loading and unloading of this drying conveyor. The tops are dry enough for stacking into piles when removed from the conveyor. These refinished desk tops are of a light natural wood color, while the original color was quite dark. Refinishing in a light color is part of the program of relighting all public schools in Spokane.

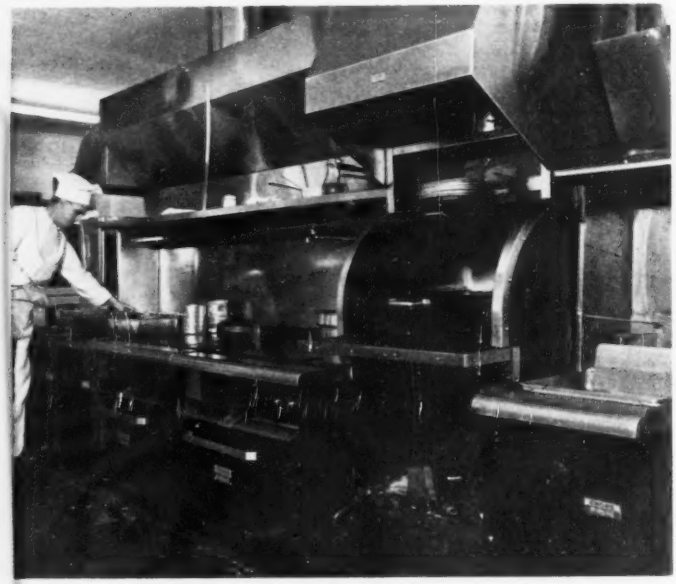
### Data

| | |
|---|---|
| Number of lamps | 18 |
| Wattage each | 250 |
| Total kw. | 4½ |
| Time tops in oven | 1 minute |
| Number tops per 8-hr. day | 200 |
| Paint used—Apex clear glass rubbing and polishing lacquer | |

# NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

## *Utilization Data Sheet No. 52*

SUBJECT: All Electric Restaurant
CUSTOMER: Chef O'Malley, Spokane, Wash.
SERVICE COMPANY: The Washington Water Power Co.
PREPARED BY: C. E. Lewis and W. A. Newman



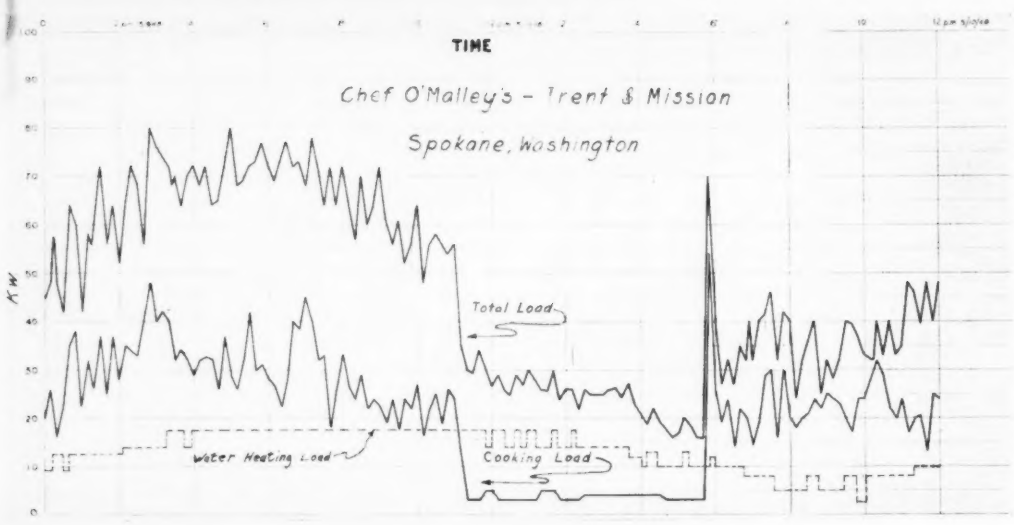
### Water Heating

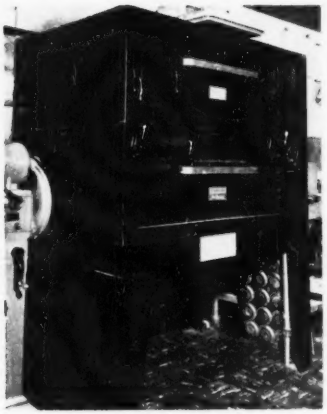
Local and state health laws demand an adequate supply of hot water for dishwashing and sterilizing. A study indicated the need for 350 gallons of 170° water. To provide this water, three 100-gal. tanks and one 52-gal. tank were installed, with the heating capacity shown in the table. They are water connected in series, so that the water goes through the small tank first and then through the three larger ones.

A 15-minute demand is the basis for billing. The accompanying chart, obtained from an instantaneous recording chart by plotting the 15-minute peaks, illustrates the effect of electric water heating on the maximum peak demand. It will be noted that the cooking and other load diversity lends itself to the use of all electric water heating.

### Realized Advantages

This restaurant was constructed approximately one year ago and consid-





erable time was spent in deciding what would be the best type of fuel to install. The governing factors in deciding on a full electric installation were:

Cleanliness
Economy
Low maintenance
Versatility in handling small and large crowds
Labor saving
Better food product
More uniform product
Better employee morale
Cooler kitchen
Dependability

Mr. O'Malley can and has, on short notice, been able to accommodate "last-minute-notice" banquets. Electric cooking lends itself to this type of service.

**Connected Loads**

| | | Kw. | |
|---|---|---|---|
| **Main Kitchen:** | 2 ranges, 3 fryers, food table, toaster, coffee urn, waffle iron | 67.4 | |
| **Bake Shop:** | 1 2-deck oven, 35 in. | 8.4 | |
| **Serving Dept.:** | Roll warmer, soup warmer, 2 coffee makers | 5.4 | |
| | **Total cooking load** | | **81.2** |
| **Mechanical Equipment:** | Dishwasher with electric heater | 5 | |
| | Salvajor, 2 mixers, potato peeler, meat slicer, grinder, saw, 7 refrigerator compressors—8 hp., 1 5-ton air conditioner—5 hp. (motor load—19 hp.) | 14 | |
| | **Total mechanical load** | | **19** |
| **Lighting:** | Interior 5 kw., exterior 8 kw. | | **13** |
| **Water Heating:** | 3 100-gal. | 18 | |
| | 1 52-gal. | 3 | |
| | **Total water heating** | | **21** |
| | **Total connected load** | | **134** |

**Demands, Energy, Miscellaneous**

| | Total | Cooking | % of Total for Cooking |
|---|---|---|---|
| Connected load | 134 kw. | 81 kw. | 60.5 |
| Maximum demand (¼ hr.) | 80 kw. | 54 kw. | (not coincident with max.) |
| Cooking coincidental with over-all max. dem. | | 48 kw. | 60 |
| Energy (month of test) | 23,786 kwh. | 10,027 kwh. | 42.1 |

Seating capacity, 260
Number of meals per month (peak, 1 day, 916), 12,021
Average watt-hours per meal, 834
Hours of operation, 11 a.m. to 2 a.m., 6 days per week

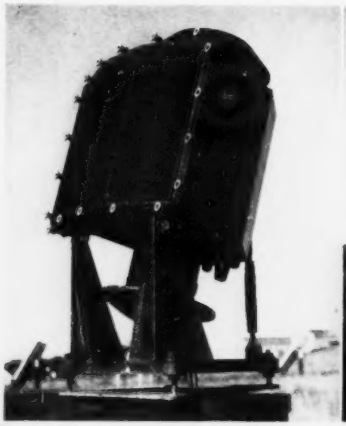


Fig. 1

Fig. 2

Fig. 3

# Airport Lighting Systems Evaluated

DURING the past two years a number of approach and runway lighting systems have been comparatively evaluated by means of repeated actual approaches to landing in fog at the Landing Aids Experiment Station at Arcata, Calif. This is a federally sponsored project for testing of aids to aircraft navigation and landing in bad weather. Arcata is credited with being one of the foggiest areas in the country. The station is supported on funds supplied by the Air Force, Navy and Civil Aeronautics Administration. The CAA acts as the contracting agency within the U. S. Government. For the past two years Transocean Air Lines of Oakland, Calif., has operated the station under a non-profit research contract with CAA.

### Approach Lighting

Among the high-intensity approach lighting systems tested during the past two years are the following installations:

*Funnel approach light system*—Consisting of two rows of fixed-wide-beam lights beginning in the approach 3,000 ft. from the runway end and converging toward the runway (Fig. 1).

*Two-parallel-row, fixed-wide-beam, system* — Consisting of two 3,000-ft rows of fixed-wide-beam lights aligned parallel with and located, respectively, 125 ft. right and 125 ft. left of the approach zone centerline (Fig. 1).

*Multiple parallel-row, controllable-narrow-beam system* — Consisting of eight rows of controllable-narrow-beam lights aligned parallel with and located symmetrically about the approach zone centerline. The rows are located 100, 110, 200 and 300 ft. left and right of the centerline, respectively, and extend 3,000 ft. out into the approach. Switching arrangements in this system permit the separate testing of a single left-row system, a two-parallel-row system, a four-parallel-row system, and an eight-parallel-row system. The units also provide for remotely controlled adjustment of beam elevation and toe-in angles to prevailing visibility and ceiling conditions.

*Single row center system*—Consisting of a single 3,000-ft. row of fixed-wide-beam projector lights located on the centerline of the approach. Continual sequence flashing system: Consisting of a single 3,000-ft. row of lights located 105 ft. left of the centerline. Each light consists of a condenser discharge flashtube superimposed on a bank of four horizontal neon tubes, six feet long. The flashtubes are synchronized to flash 120 times per minute in sequence, from the approach end of the row toward the runway. The flash has a peak light output of about 10,000,000 candlepower.

*Interrupted sequence flashing system*—Consisting of a single 3,050-ft. row of lights located 115 ft. left of the centerline. The system employs 69 individual lights spaced at variable intervals along the row, being 75 ft. apart near the runway and 25 ft. apart at the outer or approach end. Two types of lights are used, placed alternately along the row. The "flash" unit (Fig. 2) employs a condenser discharge flashtube filled with rare gas, krypton, and produces a brief flash of white light with a maximum light output of 3,300,000,000 candlepower. The "blaze" unit is made up of neon-filled tubes which can either be burned steadily or flashed by means of a condenser discharge circuit. The steady burning neon units are used alone in clear and hazy weather; for decreasing visibilities, the neon and krypton units are flashed in sequence at successively higher levels of light output. In flashing operation, the units flash 40 times per minute in sequence, from the outer end toward the runway. Each sequence is followed by a dark interval of about one second before the next sequence begins.

*Slopeline approach light system* — Consisting of two 3,000-ft. rows of light units converging toward the runway. Each of the 58 light units used in this system consists of ten light sources equally spaced along a 15-ft. bar (Fig. 4). Bars are in pairs, with their long dimensions forming 45° angles with the horizontal, and pointed at the ideal glidepath line where it crosses the line connecting each pair of lights. Thus, all the lights in each row lie in a single plane which intersects the horizontal at 45°. The two planes intersect each other at right angles along the ideal glidepath, and the line of intersection, or glidepath, touches the runway about 1,100 ft. in-

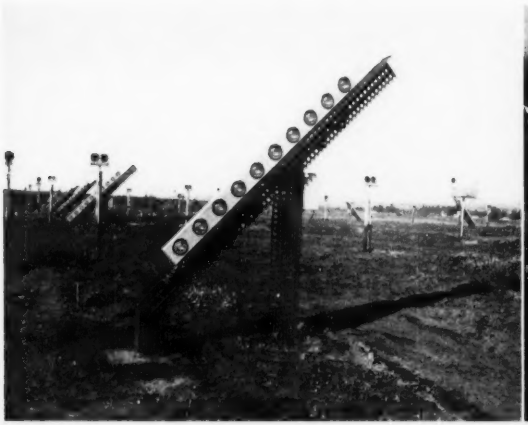


Fig. 4

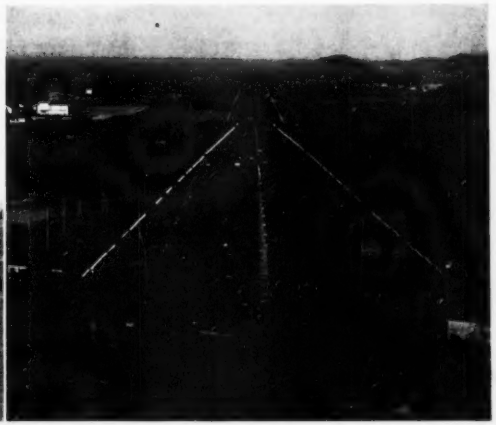


Fig. 5 Landing Aids Experiment Station photos

side the threshold. When the pilot's eye is at the intersection of the two planes, the units in both rows are seen in perspective as two straight lines converging at the touchdown point. When the pilot is above or below either plane, the units of the row forming that plane break into echelon either inward and outward, respectively. The appearance of the two rows, seen together, is sensitive to both the direction and the magnitude of the deviation from ideal glidepath, thus a pilot flying over this system is guided exactly toward the most desirable landing track. The photograph of Fig. 5 was taken from a point about 20 ft. left of, and 20 ft. below, the ideal glidepath, and approximately 3,500 ft. from the runway. This system has received CAA approval.

Fig 5 also shows the mountings and light fixtures of the several approach light systems described above.

**Runway Lighting**

The following "high-intensity" runway light systems have been evaluated:

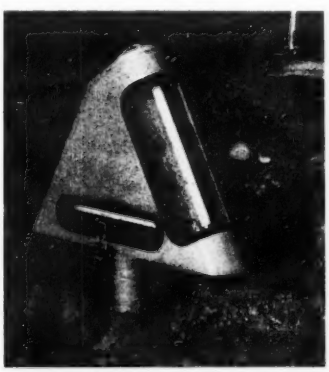
*Adjustable narrow-beam runway lights* — Placed at 200-ft. intervals along each side of the 6,000-ft. instrument runway. These units direct a small amount of light upward in all directions for circling approaches in clear weather and, in addition, project narrow beams in both directions along the runway, having about 46,000 peak candlepower (Fig. 3).

*Fixed wide-beam runway lights* — Placed at 100-ft. intervals along each side of instrument runway 31 for the first 800 ft. (touchdown zone) and 200 ft. apart along the remainder. These lights project wide conical beams along the runway toward the approach zone. Beams of at least 20,000 candlepower are directed toward all the possible normal approach paths. Peak candlepower of these lights is 45,000.

*Controllable-beam runway lights* — Placed 100 ft. apart along each side of the first 1,000 ft. of runway. The remainder of the runway is lighted by either of the other two runway light installations. These lights have a peak of 180,000 candlepower and a relatively wide main beam spread. The toe-in angles of the main beams are remotely controlled to adjust the installation for various visibility conditions.

At the present time, an installation of taxiway lights is being installed for testing during 1949. These lights are made up of two blue fluorescent tubes arranged to form a V. (Fig. 6) Vertex of V points toward the taxiway, and shows the pilot on which side of the light to taxi. Installations of taxi lights eventually will be required to guide arriving and departing aircraft to and from the runway in low-visibility conditions.

Fig. 6



**Fog Dispersal**

The two years, 1947 and 1948, have seen the experimental installations of fog dispersal burners at LAES become a practical landing aid to commercial air carrier operations. Southwest Airways first used FIDO commercially in December 1947, to land a regularly scheduled DC-3 in weather well below normal CAA operating minimums. Fog dispersal burners, using gasoline or light diesel fuels, heat the air over the inner approach and runway area, and evaporate the liquid water droplets, or fog, suspended therein, producing an increase in visibility. The heat also creates a convective circulation which lifts the heated and cleared air upward to raise the effective ceiling over the runway. Commercial air lines, during 1948, made FIDO landings or takeoffs on approximately 40 occasions. The average cost of the fuel burned in these operations was approximately $175 apiece.

In addition to further testing of airfield lighting installations, Transocean Air Lines has been assigned a project for modifying a TB-17 (B-17) used for test purposes by installing a third control station in the bombardier's nose compartment. The modification will permit a thorough study to be made, in actual low-visibility flight, of the effect of various instrument panel and windshield dimensions on the usefulness of visual aids. Another pending project is the construction of a realistic low-approach and landing simulator device, in which various lighting systems, pilots, weather conditions, and values of deviation from ideal glidepath can be tested on a statistical basis. The device will also be useful for training pilots in techniques of low-visibility landings.

# Two Letters About Labor Arbitration

AFTER several disputes in the West, among them the long drawn out and futile negotiations of the Alameda and Contra Costa County branches of Northern California Chapter, NECA and two unions, 595 and 602, which ended in a strike, had been submitted to the Council on Industrial Relations in the Electrical Contracting Industry and decisions handed down in these cases had so dissatisfied contractors and associations and privately many union members and officers, ELECTRICAL WEST expressed for them in an editorial in the November 1948 issue the feelings of the industry regarding the way in which these cases were handled. The actual expressions on the part of the industry were much stronger than the editorial. In fact several important contracting firms resigned from NECA in protest. A resolution of protest was sent to the NECA convention by the chapter.

There was no hope, these people in the industry felt, that the official publications of either association or union would voice their protest. To date no reference has appeared in the association publication relating to the issue that almost tore the organization apart, that of vacations with pay.

The editorial, however, drew comment at the NECA convention at Miami Beach. The union was more direct. Dan W. Tracy, IBEW president, wrote the editor the following letter, reproduced in full below, together with the answer to it.

It is encouraging to contractors of the West that NECA has taken steps to correct many of the criticized procedures and to give its chapters help in presenting its cases. It is to be hoped the council will also seek to act in a more judicial manner and make public the reasoning upon which it bases its decisions.

To the Editor:

The editorial which appeared in your November issue on page 89 has just now been called to my attention. The piece in question deals with the Council on Industrial Relations for the Electrical Contracting Industry, and is obviously an attempt to discredit the persons who compose it and destroy public and industry confidence in it. The writer has mastered the trick of inferring much while saying little. I am assuming that he is an editorial employee without responsibility on policy matters and therefore, I am addressing myself to you as the president and editor.

In the beginning the article states that the council was "originated with high purpose, and for many years *seemed to have been* operated with sincerity." (The underlining is mine.) I need not dwell on the inference contained in the underlined words. Then follows the exposure of its "fundamental unsoundness" which now makes its integrity "subject to question." It must be gratifying to the contractors who serve on this council to learn that its "unsoundness" results from their spineless subservience to union leadership, coupled with their willingness to subordinate the best interests of the industry in favor of their own businesses.

This blanket attack on a group of men who are trying to do something constructive for the industry strikes me as wholly indefensible. In conclusion the article states that the council, a "so-called" arbitration tribunal, must be entirely rebuilt if it is to regain the respect of the industry.

It would be appreciated if you, or the writer, would furnish answers to the following questions:

1. Who are these council members who have caused the "fundamental unsoundness" to "fester through the purpose?" Let's be specific!

2. When did any member of this council fail to disqualify himself when directly interested in a case and requested to do so?

3. What case or cases from the West Coast were decided without regard to the evidence submitted?

4. What specifically do you mean by the statement that the "council . . . decided the cases on politics of its own or appeasement of the union"?

5. What kind of remodeling do you suggest so as to permit the exercise of true impartiality and judicial integrity?

6. Who are these former "staunch supporters" who are so keenly disappointed with the recent record of the council?

You must be aware that this article contains extremely serious charges against the council and those who compose it with only the weakest kind of documentation to support them. An electrical trade publication should certainly be the last to launch an unwarranted attack against an organization which has prevented and is still preventing strife in the industry. Freedom of the press is a fine thing and we are just as strong for it as anyone, but that freedom, like all others, carries with it a certain degree of responsibility. Twisted facts, inferences, and half-truths should have no place in a publication such as yours.

I think your article has done some harm to the council, as was obviously intended. This letter cannot undo that harm but I did want you to know how I feel about it. Even a cursory check should have disclosed that your writer was not in possession of the facts. We would appreciate a more careful study should you again feel inclined to editorialize about this organization or any of the activities in which we officially participate.

D. W. Tracy
International President
International Brotherhood
of Electrical Workers
Washington, D. C.

Dear Mr. Tracy:

Your concern over the reputation of the Council on Industrial Relations is a very healthy and commendable thing and I hope that it will lead you to seek to protect it by a more constructive study of its actions rather than a denunciation of criticism of it from the outside. We are as reluctant to criticize it as you are to read such criticism. For years, we, for one, have been among its staunch supporters and have advocated its use by contractors and unions as a means of adjudicating disputes between them. And we have been proud, too, that the electrical industry contained such a court of appeal from the pressures and conflicts often found at local levels.

But, as pointed out in the editorial, if that council is to be truly a judicial and impartial court, then it must accept the very stern responsibility of strict impartiality and pass upon each case on its merits and not be swayed by other considerations.

You ask what remodeling we suggest. First, please let us make this point clear. *We* do not *make* the news, we report it. In that we differ from what might be called the "captive press" such as the *Journal* of your union and the NECA *Qualified Contractor*. Our endeavor is to "hold a mirror up to" the entire industry in all of its branches wherein it may see itself as others see it. Our aim is the improvement of the entire industry, on a healthy, fair and equitable basis. When we see actions or practices which are detrimental to the industry, we try to point them out.

Your union, the contractors association, the manufacturers, distributors, utilities—all of them should value such outside viewpoint. Faults or weaknesses pointed out within the "family" in a constructive attitude, should be corrected within the family circle before they break out and bring much more serious and damaging outside denunciation. This type of "seeing yourselves as others see you" cannot be obtained from controlled or captive publications, such as association and union journals.

I am glad to hear you say you are for a free press. Yet perhaps your views of a free press are thus limited to your experience with such publications, and not to the *complete* freedom of the press—freedom even to be wrong sometimes.

Our editorial, to which you objected so much, is not *our* own view alone, but reflects a reaction we saw in the industry as a result of several incidents recently. Now the value of such editorials to you is to call attention to conditions that your groups should correct, not merely to villify the critic.

If you wish to make the council more judicial, why not examine it yourselves and check your groups' actions therein. The NECA group, too, should do the same from its standpoint. It is not for us to tell either of you how to make it more judicial. We merely see the need for its being so, based upon our findings in the field.

It needs to give assurance to the industry that its members *do* act on the merits of each case. As such an assurance a report on each case and the basis on which the decision was reached, such as is common in any court procedure, would eliminate cause for suspicion that "politics" or "appeasement" entered into it. There is no such assurance at present. Therefore the question naturally raises itself.

You asked for documentation of our "charges." We make no charges. We reflect the disappointment of many contractors and others in the industry. This disap-

pointment is over the way in which several recent cases were adjudicated. To go into these in detail would be to try them all over again, and serve no useful purpose.

Contrary to your inference, all of our editors live very closely with the people in the industry. They are perhaps much closer to those *people* than your official family and get a truer response to their actual feelings and thoughts.

As to naming those who are disappointed in these recent actions, from close personal observation of past events, we regret to have to say that we will not subject anyone to possible reprisals. I know this is a serious inference, but it is also a realistic one. Such actions come not so much from your office, but often from far less responsible and less fair-minded local officers of some local union.

The editorial you criticize should do no real harm to the council that has not already been done by its own actions—whether intended or misunderstood, because they were not sufficiently clarified. What it should do for all *true* supporters of the ideal the council was conceived to bring into being, is to turn your energies toward the elimination of such weaknesses and omissions as it has suffered from in the past, and thus make the council immune from similar criticisms in the future. It is still a very fine idea and ideal and it *has* done great good. Let it therefore make itself above reproach by accepting the fullest responsibility.

The past few years, we appreciate and understand, have been very trying to your union and to the industry. Because of war work demands for manpower, you have had to set aside your former technical qualifications for membership and your ranks are probably filled with many who do not deserve the scale nor the respect that a well-qualified journeyman used to take pride in. This has also caused your union leadership to have put upon it unreasonable demands by radical elements within it. The voting strength of such a new element is sometimes large, we can appreciate, and we know your officers are under such pressures.

Contractors on their side have been desperate for men and materials. In their desperation, many have resorted to expediencies that have brought grief to their fellows and discredit to the industry.

It is to be hoped that both organizations may strive to recover from these destructive influences. Your groups are doing a splendid job in many localities. This is particularly true in apprenticeship training, and we are glad always to publicize such works.

Believe me, we are not antagonistic to your union in the least. Our opinion is that it is one of the best in existence. But, if there is anything in which it can improve itself and thus the industry of which it is a part, surely you should welcome it even if it appears in the form of constructive criticism occasionally.

The Editor.

# and Another About Radiant Heating Insulation

To clarify further the question of insulations on heating wire to be used in radiant heating built-in installations, the following letter from L. N. Roberson distinguishes between the performance of thermoplastic and thermosetting compounds based on his experience. Roberson writes in the letter:

"As type T and TW wires are of polyvinyl chloride insulations, some manufacturers may be desirous of overlooking the defects of this material. However, we have found they are not satisfactory on either the copper-bearing or the chrome-nickel alloys. On the copper-bearing alloy the pitting is very severe. It is not as severe on the chrome-nickel alloys.

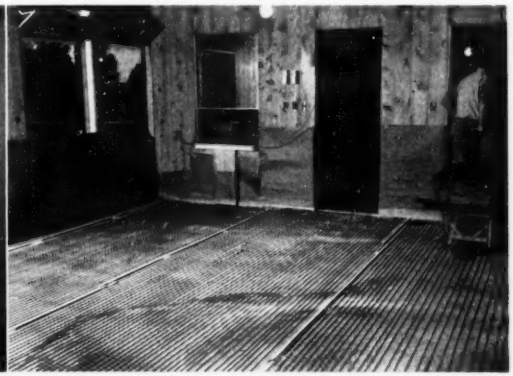
"However, the deterioration of the insultation is about equal on both types of elements. The plasticizer seems to evaporate out of the material and chloride of some type is formed. This attacks the copper-bearing alloys in particular. The shrinkage in the insulation is so great that at times it is sufficient to pull the wire in two. The insulation becomes very hard and brittle and will shrink to half its diameter. There is a proportionate decrease in length. The insulation will thus check and form rings on the wire rather than stay intact, due to its brittleness.

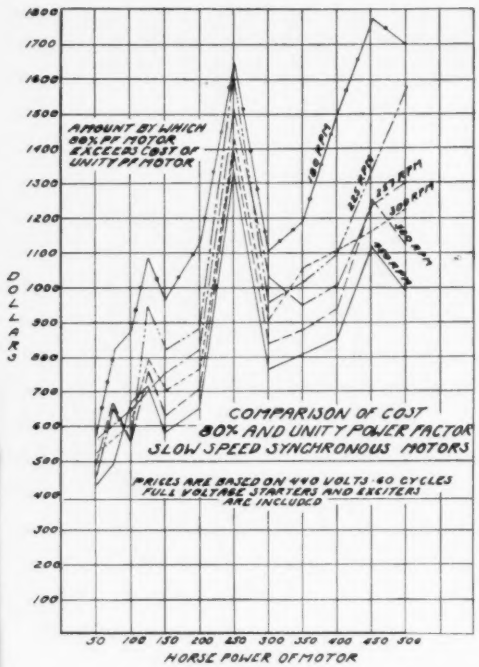
"The material we use is a thermosetting plastic, as distinguished from a thermoplastic. The Simmonds-Ellis Handbook of Plastics distinguishes a thermoplastic as one capable of being repeatedly softened by heat. A thermosetting plastic is capable of being hardened by heat or vulcanized to take a permanent set. Some of the thermoplastics are: ethylcellulose, polystyrene, polyvinyl chloride. Plastics of the thermosetting type are: phenol formaldehyde resin, natural rubber, butyl rubber, modified butadiene polymers, polychloroprenes and organic polysulfides.

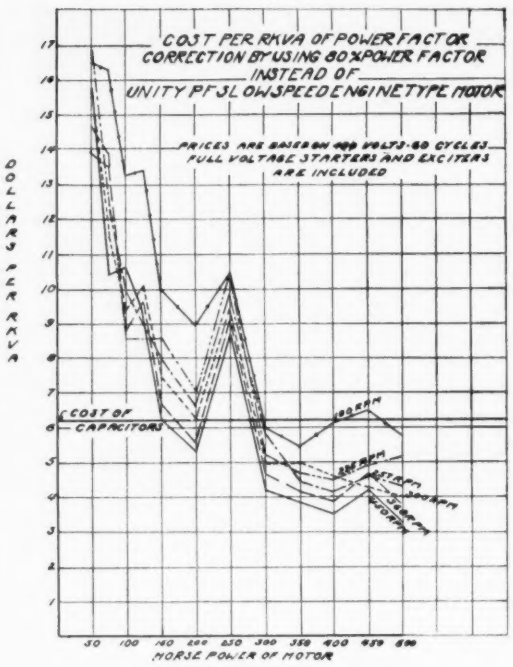
"We have been working for approximately 15 years in attempting to find a suitable plastic for this purpose. We feel that we have a very satisfactory product at the present time. Underwriters' Laboratories Inc., in its tests at the house last year, removed part of the plaster ceiling so that we could examine units that have been in use approximately ten years. The insulation was still soft and pliable and withstood a potential test of 2,500 volts.

"The urea and formaldehyde plastics do become hard and brittle, while vulcanized rubber takes a permanent set which still remains extremely elastic and flexible."

**Two pictures not used in preceding articles on radiant heating. Left, only indication of a heating system is the wall thermostat and switch; no wall discoloration even after two years operation. At right, two thermostats used, one controls one heating element; the other set 1° below, operates other element part time to diversify the load**




AMOUNT BY WHICH 80% PF MOTOR EXCEEDS COST OF UNITY PF MOTOR
COMPARISON OF COST 80% AND UNITY POWER FACTOR SLOW SPEED SYNCHRONOUS MOTORS
PRICES ARE BASED ON 440 VOLTS 60 CYCLES FULL VOLTAGE STARTERS AND EXCITERS ARE INCLUDED
DOLLARS
HORSE POWER OF MOTOR


COST PER RKVA OF POWER FACTOR CORRECTION BY USING 80% POWER FACTOR INSTEAD OF UNITY PF SLOW SPEED ENGINE TYPE MOTOR
PRICES ARE BASED ON 440 VOLTS 60 CYCLES FULL VOLTAGE STARTERS AND EXCITERS ARE INCLUDED
COST OF CAPACITORS
DOLLARS PER RKVA
HORSE POWER OF MOTOR

# Low Power Factor in Industrial Plants—

## and what to do about it

W. C. King
Los Angeles

V. Does it pay to use a leading PF slow-speed motor?

SUPPOSE we have decided to install a slow-speed synchronous motor—should we go to leading PF or stick to a unity machine? The former costs 20% more, requires a larger exciter, and usually a more expensive control; it is a common belief that the additional correction gained will cost more than capacitors. This is sometimes true, but not always.

Let's take a 300-hp., 360-r.p.m. drive:

| | Motor | Exciter | Control | Total |
|---|---|---|---|---|
| 80% PF | $3,927 | 929 | 1,318 | 6,204 |
| Unity | 3,298 | 750 | 1,318 | 5,366 |
| | | | Difference | 838 |

Efficiency of 80% PF Motor....92.6%
Then, kw. input..... 241

Leading rkva.=.75 x 241=180.5
Cost per rkva.=838/180.5=$4.65

Since the cost of capacitors averages $6.20 per kva. we see that we can more economically get correction by using an 80% PF motor.

The first set of curves shows the increased cost of 80% PF motors (including exciters and control) from 50 to 500 hp. and for six speeds between 130 and 450 r.p.m. Figures for other standard speeds may be approximated by interpolating between the curves.

The second set of curves was obtained by going through the calculations as shown above to determine the cost of the rkva. gained with each hp. rating.

It will be noted that, except for a couple of sizes, capacitors will be cheaper when the motor is below 300 hp.

### Difference in Power Cost

A motor driving a given load and supplying leading rkva. naturally takes more power than the unity machine. Let's check the motor discussed above:

Kw. input to 80% motor..... 242.0
Kw. input to unity motor..... 241.0

Assume 3,000 hours operation per year and an average power cost of $.0095 kwh. Increase in power cost for the 80% PF motor is (3,000 x 1.0 x .0095) or $28.

Although capacitors cost little to operate, nevertheless, in this case they would consume $15 worth of power, leaving a net difference to be charged to the 80% motor of $13. This is too small to affect our decision.

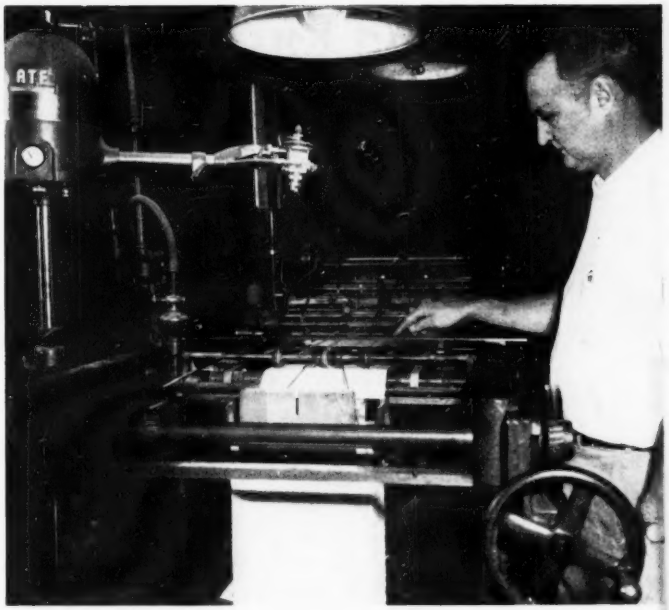
Other cases might work out differently: Take a 500-hp., 225-r.p.m. motor operating continuously, for example.

Difference—80% and unity.....$1,570
Cost of equivalent capacitor.....$1,878
Saving in investment..... $308
Additional kwh. per year.....35,000
Cost at $.0095 ..... $332

Thus, the cost every year will be more than the saving in investment. Each case should be figured out on the basis of the operating conditions.

# Radioactive Polonium Eliminates Static

Air becomes conductor under alpha radiation of element 84, thus dissipating static charges. Industrial applications are simple and relatively inexpensive



Alpha radiation from bar of polonium causes air to become a conductor, dissipating static charge on sheets of paper passing through printing press

STATIC electricity has caused man no end of trouble and annoyance. Recently a means of neutralizing static charges has been found that at last puts to an end many of the nuisances of this form of electricity. By means of a metal strip plated with the radioactive element polonium, static charges on paper passing through printing presses and static charges arising in many other industrial processing operations are completely eliminated.

It has been known for some time that the alpha radiation of radium was a powerful ionizer. Now, as a by-product of the atomic age, there has become available in the process of refining uranium a comparatively inexpensive commercial supply of polonium, element No. 84. Polonium radiation is pure alpha particles. It has none of the harmful gamma radiation of radium and is non-injurious unless taken internally. In the process of neutralizing static, alpha particles passing through air ionize the gas molecules, forming positive and negative ions, causing air to lose its insulating properties, thus dissipating the accumulation of static charges on nearby objects.

Use of polonium as an industrial static eliminator is immediately suggested. A convenient means of using polonium has been devised and there are now numerous industrial applications. A number of these have been worked out by Dr. Kenneth A. Smith, development engineer for the Henry N. Beets Co. of Los Angeles, Western agents for the Canadian Radium & Uranium Corp., refiners of polonium, and the Gibbs Manufacturing & Research Corp., fabricators of polonium. These organizations market polonium-coated metal bars under the trademark "Alphatron" as industrial static neutralizers.

One very practical application is in the elimination of static in the handling of paper and paper products, particularly in printing establishments. The accompanying photograph shows an application on a printing press in the plant of Wolfer & Marleau in Los Angeles. The steel strip indicated is plated on one side with a very thin coating of polonium. Over this there is an extremely thin layer of gold plating to prevent physical contact with the polonium and to prevent oxidation. The alpha particles emitted by the polonium are stopped by about 2 in. of air converting them into harmless helium atoms. Therefore, the metal strip must be placed preferably less than this distance from the paper or material to be deionized, although neutralized air currents passing from the bar will extend the effective range.

Polonium is a decay product of radium (old radium F) with a half-life of 136 days. For this reason, the effective life of a polonium plated bar is from one to two years. Polonium is sold by the millicurie, which is a measure of radiation equal to about three trillion ionpairs per second. In practical terms to the layman, the deionizing bars cost about $6 per square inch. Since the polonium plating on the bar is one inch in width, usually, a bar 20 in. long would be worth $120. This high-sounding cost, however, may be comparatively low when it is considered that static charges on paper or other objects could easily cause hundreds of dollars production loss in a matter of hours in many industrial plants.

Numerous other uses have been found for the static eliminator. To mention a few: A short strip is placed at an angle on a camel's hair brush to dust of phonograph records, particularly high-fidelity recordings in FM broadcasting stations. It is used in phonograph record recording studios to prevent statically charged cuttings from damaging master recordings. It is used in motion picture film processing to prevent static charges on film from attracting dust particles, and also in enlarging and color film work. It is used to take the static off ladies nylon and rayon slips in lingerie shops. It is used to take the static charge off the laminated glass of airplane windshields that may shatter under lightning-like discharges. It is also used in lithographing plants, in the making and printing of plastic bags and in many other industrial operations.

# 110-kv. Ring Bus for Denver Expansion

FACED with phenomenal load growth in Denver and metropolitan area, the Public Service Co. of Colorado found it necessary several years ago to provide a pattern for system expansion and to provide a network to receive power from present and future generating sources. In the studies the Denver area was divided into transmission substation districts by starting with the three existing substation locations and taking into account feasible transmission line routes, city zoning, airports, available space, existing 13-kv. lines, the 3.5- and 10-mile radii, and other factors. It was found that a 110-kv. ring or belt line around the city was the best solution. It would extend from Arsenal substation around the east side of the city and south to South Terminal with new substations at East, Leetsdale, and Lakewood as the first step in the program. The general plan is as shown in the diagram.

### Work Underway

Work on this development is now well under way. The use of an intermediate voltage of 44 kv. was investigated instead of 110 kv., but it was found to have higher losses, less capacity, greater voltage regulation, and higher cost of construction. The same limitations seemed to apply to 69 kv. These voltages were therefore abandoned in favor of 110 kv. The route of the 110-kv. ring bus was such that overhead type of construction could be used. One of the accompanying photographs shows a typical 110-kv. single-pole structure on a city street and another an H-frame in the fringe territory.

A cable tie can be made from Leetsdale substation to H, a distance of 3.2 miles where a 110-kv. substation can be built. The cable can be extended to North substation a distance of four miles. This would provide a high-voltage tie across the city and would locate a transmission substation in the heart of a heavy load area, relieve loads on other substations, and increase the capacity of the loop. Additional transmission substations can be located at Arsenal and Junction — also, southeast, northwest, west and southwest of the city, and south to Englewood to complete the ring. Another location is available downtown near B, which could be supplied by a 110-kv. tie from Terminal to Arsenal Junction along the Platte River.

### Provides Flexibility

This indicates that the pattern of development is such that a 110-kv. ring or bus will be built around the city and that substations can be connected to it as load develops in any area such as to require high-voltage supply. Also, lines from power generating sources can be brought in from any direction that may be desirable, and connected into this 110-kv. network. Substations inside the city limits can be fed at 110 kv. by short cable taps. This shows the flexibility of the plan for receiving power and transmitting and distributing it at 110 kv. to any point in the area at any time that it is required. As more and more power is brought into the loop from hydro and steam generating sources, breaker interrupting duties can be held to reasonable values by proper system design.

As may be seen from a study of the single line diagram, the general philosophy of the plan is to feed a number of major substations from the 110-kv. ring bus, stepping down to 13.8 kv.; running radial 13.8-kv. feeders to 13.8 4-kv. distribution substations located as needed. Studies of the heavy loads which can be expected in

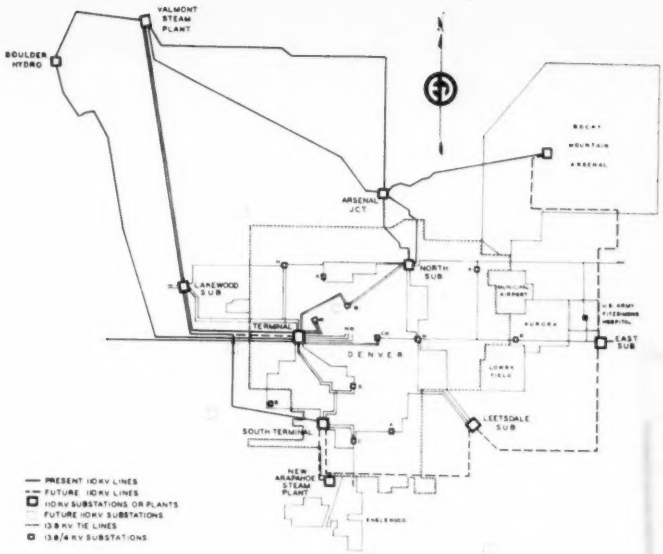
110-kv. line using wishbone construction with overhead ground wire is typical of lines built on Denver streets forming 110-kv. ring bus serving area

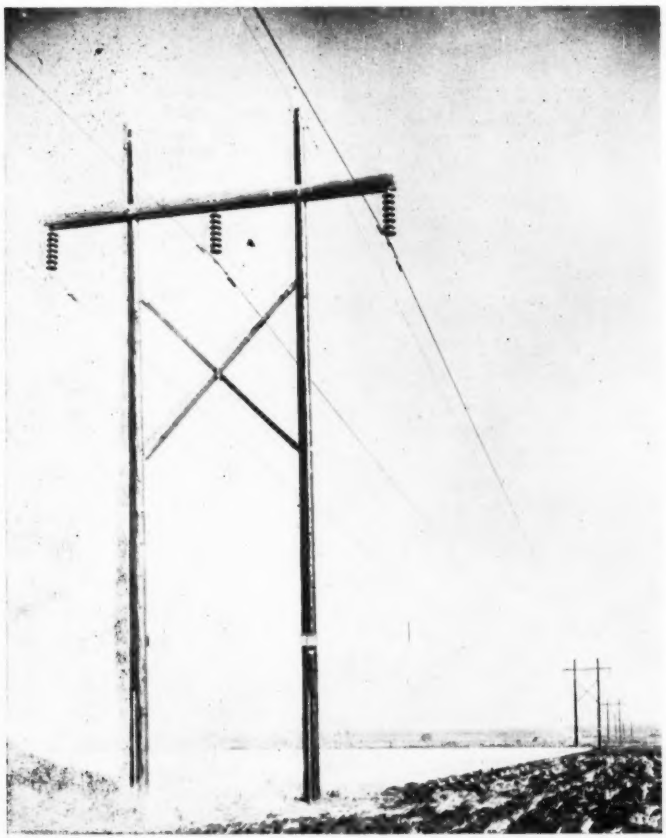
**L. M. Robertson**

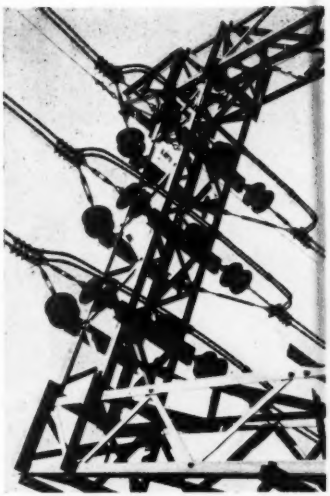
Denver, Colo.

the future indicated the desirability of distributing the larger portion of the load inside the ring bus directly at 13.8 kv. The plan is further flexible in that if future load density should justify, and it were deemed advisable from an operating standpoint, 13.8 kv. could be used as primary distribution voltage instead of the present 4-kv. standard.

Having adopted a master plan for serving the fast-growing Denver area, the Public Service Co. of Colorado is building to the pattern as load increases demand. North substation was one of the recent major steps. For 1949, the company has budgeted $12,900,000 for betterments, a portion of which will go into development of the 110-kv. loop system.



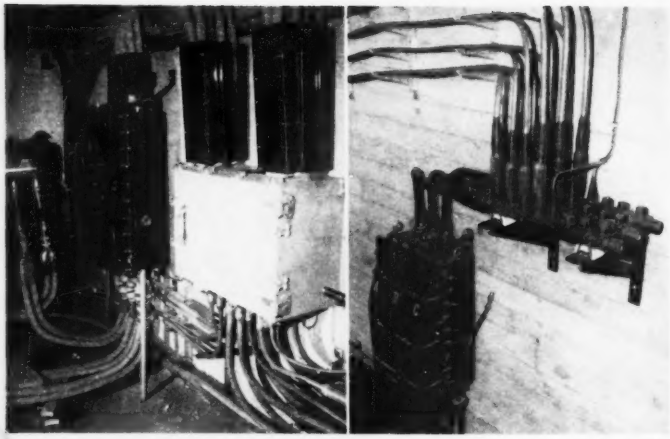





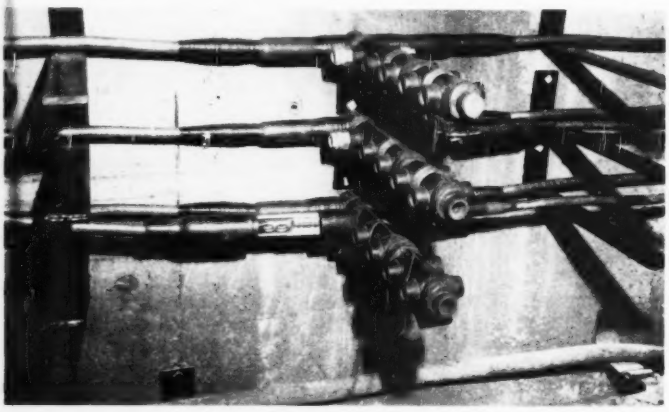
Interesting details of 13.8-kv. two-conductor bus using turnbuckles at major substations on 110-kv. ring bus

H-frame 110-kv. loop line (left) used in fringe territory around Denver Metropolitan area in connection with long-range distribution plan for Denver area

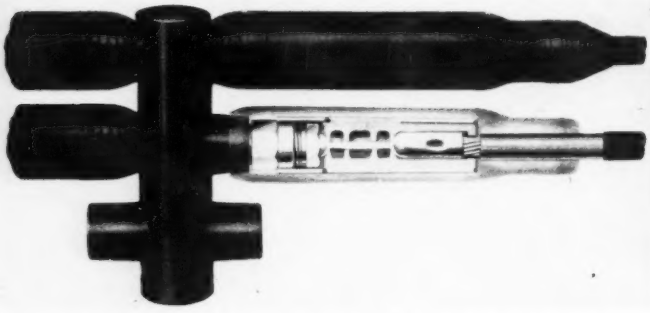
Master plan for serving metropolitan area (top of page), now well along, calls for 110-kv. ring bus feeding a number of major substations direct or by cable stepping down to 13.8 kv. for radial feed to 4-kv. distribution subs



Conventional junction box installation (left) and new limiter installation (right) showing the space saving effected with limiters. In limiter view leads are shown coming from network protector and connecting to insulated terminal buses of limiter. Limiter displaces junction box with space saving of one-half and cost saving of sixty and one-half besides providing fusible link for fault clearing



Installation of limiters with one of the rubber sleeves slid back to show the asbestos arc chamber (the cover shell is removed) containing the fusible link



Phantom view of the Molimiter assembly with asbestite shell and rubber sleeve

# Limiters Protect A-C Underground Network

In a program designed to provide ultimate complete fault protection on its a-c underground secondary network, Portland General Electric Co. has recently completed the first installation of limiters. The "limiter" is an enclosed high-current fuse link for installation directly in the heavy secondary cables of the network. The device is tradenamed "Molimiter" and is made by Burndy. Up to the time PGE launched the limiter program, reliance had been placed in primary transformer fuses for protection and in the uncertain ability of the network to burn clear secondary faults. With only four 4,160-volt primary circuits feeding the 280-block network, little faith was had in ability to burn faults clear.

The limiters serve the dual purpose of providing fuses in the feeders and secondary mains, and in providing a bus to which the heavy secondary cables are connected. This provision for busing eliminates the need for conventional junction boxes, which are merely large waterproof metal boxes containing bare busbars to which the cable lugs are bolted. One of the accompanying photographs shows a junction box installation. Another view shows the comparative simplicity of a limiter installation made at about 40% the cost of a junction box job, and taking up only about half the space. At the same time, each feeder cable tapping the limiter bus contains a fusible link for isolating the cable in case of fault. The fusible link is contained within a split hard-pressed asbestos shell to confine the arc. A rubber sleeve slipped over this shell is then taped to make a completely waterproof job. Standard limiters replacing junction boxes have provision for two 1,500-MCM transformer leads and eight outgoing circuits up to 500 MCM. If more circuits are desired two limiters can be used to take up to 16 circuits.

In the initial step of the program limiters have been installed at alternate street intersections, dividing the network into four-block sections. Next phase, will be to equip practically all the remaining intersections to provide single-block fault isolation. Completion is planned for 1950. Ultimately, limiters will be installed at mid-block sections to carry protection down to the few circuits immediately adjacent to a fault.

TOTAL KWH
PREMIUM USE KWH
DIFFERENTIAL REGISTER TYPE JD-1
FOR USE ON TYPE J WATTHOUR METER
15 AMPS 240 VOLTS 3 WIRE 60 CYCLES
METER SERIAL NO. K 5.6
LOWER POINTERS INDICATE KWH CONSUMED BY THAT PART OF LOAD (KW) WHICH IS GREATER THAN 3.0 KW
SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS, U.S.A.
Fig. 1

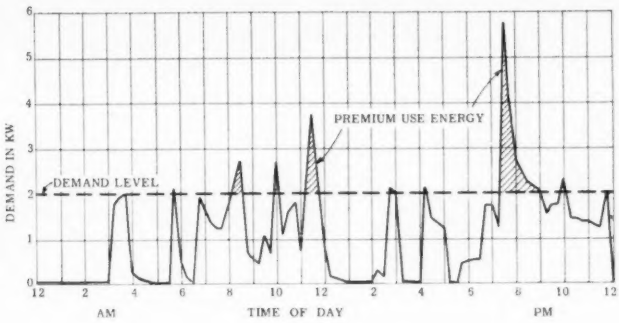


Fig. 2

# NEW METER FOR NEW DEMAND RATES

**Willard M. Nott**
San Francisco

WITHIN recent years, the rapid increase in the use of electric space heaters, water heaters and ranges in the home has persuaded many rate engineers that it is becoming advisable to broaden demand schedules to include a larger number of small energy consumers. The ratio of a utility's fixed charges to energy costs is becoming higher, so that the aggregate effect of small consumer peak demand (which sometimes coincides with industrial peaks) is becoming an increasingly major factor in a utility's basic cost structure.

Probably the chief drawback to the broadening of demand rates to include small customers has been the investment and maintenance costs of demand equipment. These have been high when compared with the return for energy delivered which could be fairly charged the small consumer. The low maintenance cost of the thermal-type demand meter has helped in this respect considerably, but many rate men feel it will be necessary to extend demand measurement to levels lower than are economical even with the thermal meter.

In recognition of the problem very briefly outlined above, the meter industry has been investigating methods of low-cost measurement of demand that can be applied to small consumers of electric power. One method suggested is the use of the differential register shown in Fig. 1 which can be mounted on a standard single-phase or polyphase watt-hour meter. This unit is simply the usual kilowatt-hour register with the addition of one set of four "premium rate" dials, a differential gear, and a synchronous motor. The standard dials register all kilowatt-hours used by the customer. The red "premium rate" dials register only when the customer's demand exceeds a certain level which is predetermined by system conditions and written into the rate schedule. These dials register all kilowatt-hours consumed above this demand level, eliminating all kilowatt-hours below it.

This is accomplished by feeding the meter disk rotation and the synchronous motor rotation through suitable gear reductions into opposite sides of a differential gear. When the disk speed is less than the motor speed, a ratchet prevents reverse registration on the "premium rate" dials. The gear reduction from motor to differential is such that, when the disk speed increases beyond the point representing the chosen demand level, registration is effected on the red "premium rate" dials. Any one of a number of different demand levels may be used, the desired level being fixed by choice of the correct gear ratio.

The customer is billed for all kilowatt-hours recorded on the standard dials at the regular rates. For kilowatt-hours appearing on the red dials, however, he pays a special premium rate. This results in his paying more if this demand is frequently high, less if his demand is consistently below the predetermined level.

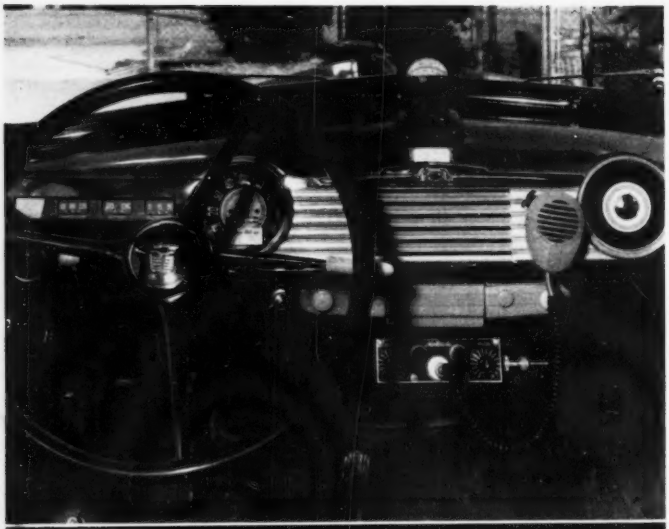
Since utility capacity must be adequate to meet the diversified demands of its customers, some rate engineers believe that the cost of a system should be prorated for the average customer and should be a major factor in setting the rate for each customer class. In accordance with this theory, any customer exceeding the average demand for his class could be charged equitably at a special rate for the service he expects. From this standpoint, the differential register would provide adequate data for equitable billing.

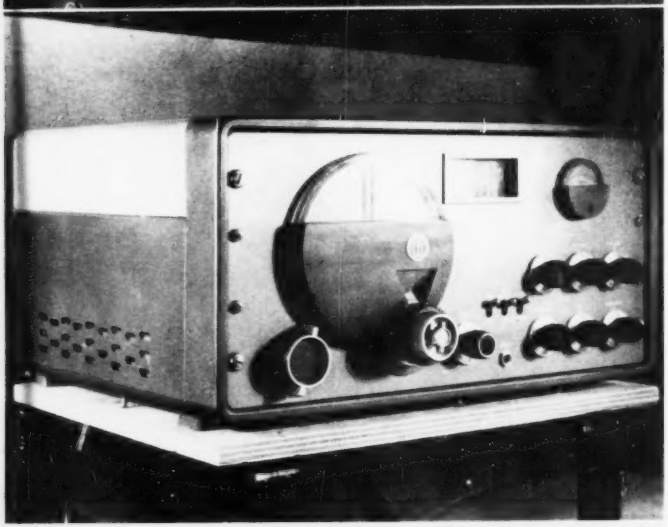
Fig. 2 shows how the register would record when set for a demand level of two kilowatts and the meter connected to a typical house load. The black dials would record all energy under the curve, while the premium dials would record only the shaded portions above two kilowatts. For a higher demand level, the premium rate would probably have to be increased since registration would be reduced. For a lower level, the premium rate could be reduced.

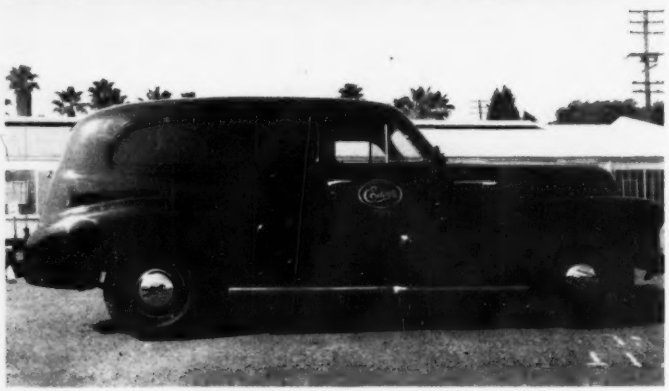
Regarding the cost difficulty of extending demand rates to small consumers, it is believed the differential register will be of value. The initial cost is below that of other existing demand devices. Also, due to the simplicity of the design and application of the component parts, it is expected that maintenance costs will be relatively low.

One serious difficulty has been the question of educating laymen both as to the purpose and application of demand rates. It is not only important to the utilities to have a rate structure which is fair to them and to their customers, it is also highly important from a public relations standpoint that the customer be able to understand the rates easily and agree that they are equitable.

It is felt that the differential register offers a good psychological approach to the small consumer.







# Television Interference Problems

WITH television extending up the Pacific Coast, utilities are coming face-to-face with interference problems reminiscent of the early days of radio. The Los Angeles area, with five television stations now operating, has become the West Coast's proving ground for just how serious the interference problem is really going to be. Out of a recent Los Angeles joint meeting of the Television Service Managers group and a committee of the Pacific Coast Electrical Assn. under H. C. Rice of Southern California Edison Co., there came much revealing information on the TV interference problem as it affects all branches of the industry.

After everyone's troubles had been aired, it became evident that electrical utilities are responsible in only a small percentage of cases. For this reason Southern California Edison Co. has adopted a policy under which TV complaints must first be investigated or screened by a dealer to determine that the utility is involved before Edison will send out an investigator. A similar policy has been adopted by the Northern California Electrical Bureau which handles radio complaints in the San Francisco Bay region.

The only causes of TV interference specifically laid at the door of the power companies were loose hardware in the presence of high-voltage fields, and leakage from wires in trees. No doubt other causes of utility interference will turn up, but the significant fact developed at the meeting was that interference from power lines is minor as compared with all the other troubles that can beset the television set owner. The finest spirit of coopera-

**Type of radio interference equipment used by Southern California Edison Co. to which television receiver has been added for investigating television interference complaints. Upper view shows dash with microphone for 2-way FM radio. Center shows a model SX-42 Hallicrafters special analyzer. Chevrolet panel job used as communications department mobile unit is seen below**

tion was manifest at the meeting, but utility representatives made it clear that they do not propose to have all of television's troubles saddled on their shoulders as was done with radio in the 20's.

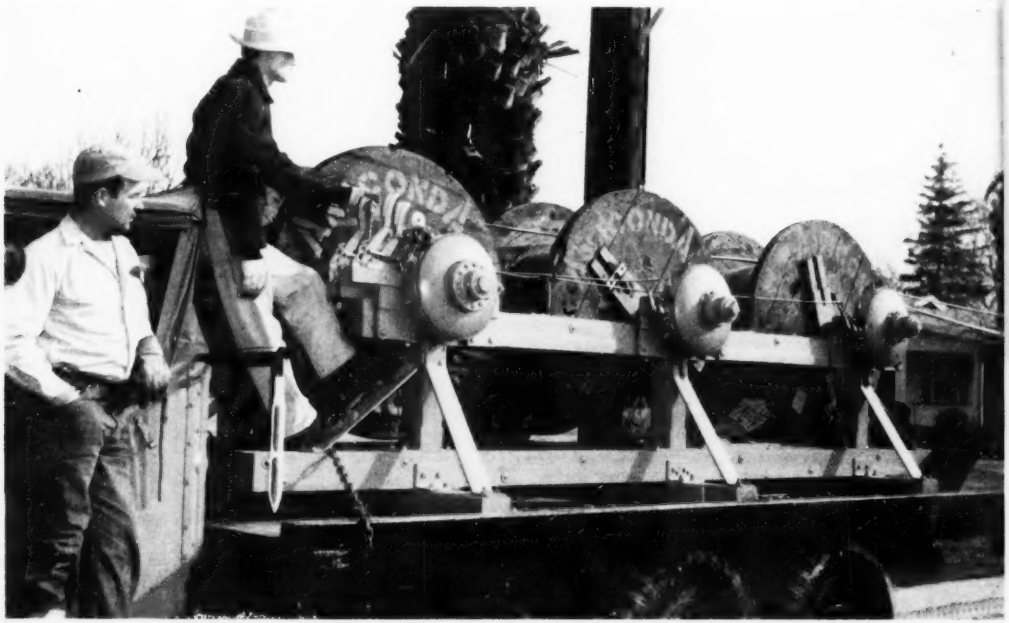
Nevertheless, utilities are equipping themselves to handle TV interference. Southern California Edison has equipped its communications mobile units in five of its divisions with portable television receivers of the very finest model for this type of service. The accompanying views show this equipment. These cars handle all problems connected in any way with the company's own communications system as well as radio interference, and now television. This is a little different setup than most power companies have, but in the Edison company's experience it has proved most satisfactory.

### Other TV Troubles

From discussion at the meeting mentioned it seems that television is highly critical. Most cases of poor images, flashes, pips, fading and distortion are traceable to installation conditions, location or customer-produced electrical disturbances in the neighborhood. Many locations are not suitable for good TV reception because of geographical and physical conditions. Since the high frequencies used in television behave much as do light waves, any hills or objects in the direct path from transmitter to receiver antenna cause loss of signal. Buildings, poles, branches of trees and even clouds, cast shadows. Many objects, including airplanes, reflect TV waves and produce ghost images on the screen.

Antennas are critical and highly directional. Antenna transmission leads swinging or moving in the wind cause a wavering picture. Automobile spark plugs produce pips, or white spots, in the picture as well as noise in the audio of the receiver. Diathermy machines, even blocks away, cause flashes and pips. Short-wave amateur transmitters cause trouble. Arcs from electrical contacts, controls and thermostatic devices show up in the picture. Some types of stero lamps are producing trouble. An electronic garage door opener has put as many as 20 television receivers out of commission. Even some of the older television receivers interfere with one another. TV receivers have a powerful oscillator, and receivers with certain IF frequencies can cause interference with other receivers several blocks away.

These are some of the headaches of television so far. Notwithstanding, television has received public acceptance and the public has bought television receivers in southern California to the tune of 30,000 in the first two years of commercial television there. Few of the troubles recounted are insurmountable. Transmittters are getting better and receivers are being improved. As long as all branches of the industry work cooperatively, as they are now doing, difficulties will be resolved and the public can buy with confidnce and enjoy this latest of electronic achievements.



# Braked Reels

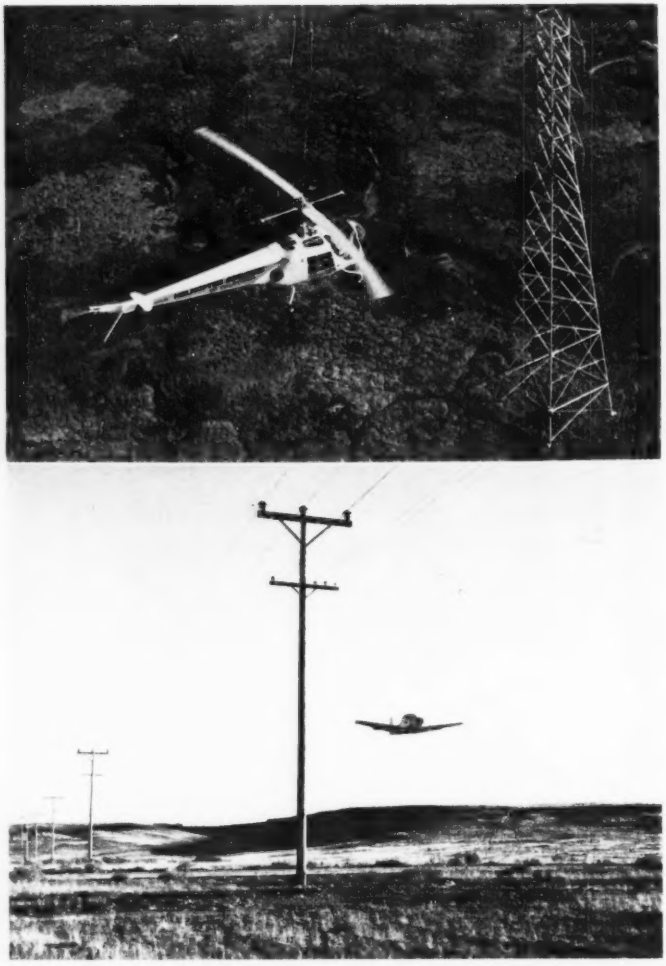
The problem of holding tension on conductors being strung was solved by the California Electric Power Co., Riverside, Calif., by three reels fitted with brakes as shown. Ability to keep wires under controlled tension simplifies stringing, especially on existing pole lines and in congested areas where energized circuits are involved.

The stringing rig consists of a suitable timber chassis for mounting the three reel shafts. To the shafts there is a welded arm for holding the reels as may be seen. The brakes consist of old Cadillac mechanical brakes mounted on the reel axles as shown. Rods from each extend to brake levers where the man is sitting. Tension on each reel is individually controlled, but rods are so adjusted that by keeping all three levers in line and operating them together, the three reels can be controlled as a unit.

# Western Utilities Join the Air Lift

DURING California's recent heavy storms, helicopters stepped out of their role of routine line patrolling to perform invaluable service in locating breaks in transmission lines and in landing men and material to repair a transmission break in a snow isolated area. Pacific Gas and Electric Co., which uses California Helicopter Service for line patrol, made good use of helicopters in locating transmission breaks in the mountainous areas around Clear Lake and on up to Garberville on the Redwood Highway. Unprecedented snows raised havoc with transmission lines, building up snow and ice coatings until conductors were the size of a baseball bat. During breaks in storms, a helicopter with PG and E observer would patrol lines and locate trouble. Then the observer would spot ground crews and drop notes giving locations and best means of access. During a January storm a helicopter, flying for the Pacific Telephone & Telegraph Co., located trouble on a PG and E line in the Clear Lake region and notified the power company of a break it was unaware of. In an early February storm a helicopter flying for PG and E was the only means of communication with Garberville to notify the district office there of points of trouble so ground crews could be dispatched. Highway, railroad and communication lines were all out.

Southern California Edison Co. suffered a failure on its 110-kv. line to San Diego that took out two steel towers. A helicopter of A-F Helicopters located the trouble on a patrol road blocked by snow. Three helicopters were used to transport 50 men, tools and equipment to the job from the highway ten miles away. Round-trips could be made in ten minutes. After heavy equipment had broken through to bring in poles and other material, the helicopters flew in gas, oil and water to keep trucks operating. So urgently was the line needed that men worked every minute of daylight. The helicopters operating after dark then landed with the aid of emergency floodlights to take the men out. Two-way radio from a ground crew to the outside further aided operations and made possible energizing the line immediately upon completion of repairs. This is the first time the Edison company has used helicopters for emergency work but they proved so satisfactory in this case, with a two-thirds saving in time, that the company has decided to continue their use on emergency work, in addition to the line patrolling work they have been doing for more than a year.



Helicopters used by utilities (upper) for line patrolling performed invaluable service during recent California storms in locating and aiding in repair of transmission breaks. Lower: Ryan Navion, used by Idaho Power Co. for regular and emergency line patrol work. The Ryan Navion flies as slow as 75 miles per hour

Other Western utilities also are making good use of airplanes. Bonneville Power Administration uses helicopters for patrolling. Montana Power Co. uses a commercial airplane service for both routine and emergency patrol. Idaho Power Co. has used the Ryan Navion, flown by Aircraft Service Co. of Boise, for inspection and patrol work, both routine and emergency. A radio in the plane operating on the same frequency as used by the power company's line trucks makes possible transmitting information to ground crews.

Erick Johnson Owen Hurd D. L. Marlett C. C. Moore Gus Norwood Avery Moore

# NWPPA Discusses Load Growth

DISTRIBUTION system planning to meet continuing load growth was major topic of discussion at the mid-year meeting of the Northwest Public Power Assn., held in Portland, Feb. 16-18. Public Utility Districts, municipalities and REA cooperatives in four Northwest states forming the public power association, were well represented. Lesher S. Wing, regional engineer, PFC, San Francisco, pointed out the value of regional power market surveys and discussed in some detail types of surveys and forecast methods used by the Federal Power Commission. Failure of power resources to keep pace with load growth is largely attributable to factors other than faulty load forecasts, in his opinion. Speaking of the West, he said we may expect a continuation of load growth for many years in excess of the national average.

Explaining that NWPPA was merely offering a service to its members in the matter of securing aluminum conductor, President Carl C. Moore, called on Avery Moore, National Rural Electric Cooperative Assn., Washington, D. C., and W. S. Feit of the Wisconsin Electric Cooperative from Madison, Wis., to explain details of the recent deal between the Wisconsin Co-op. and Reynolds for a supply of ACSR to break the conductor bottleneck. Under the contract, the Reynolds company will start up the Jones Mill pot lines in Arkansas and conductor will be available in 45 days, or about April 1. Seventy-five million pounds of ACSR will be available for 1950, and fifty million pounds thereafter until 1953. For the first three years, public utility agencies purchasing conductor from the Wisconsin Electric Co-op., acting as national distributor, will be required to make a deposit of four cents per pound. One cent goes to the co-op for handling costs and the other three cents into a fund until $6,000,000 has been deposited with Reynolds. The co-op has until May 14, 1949, to raise this deposit on advance sales booked. Any surplus from the one cent to the co-op will be divided among purchasers. A priority system has been set up by Wisconsin Co-op to assure fair distribution. Contract with Reynolds has an escalator clause and is for 14 years. Reynolds will produce only the aluminum. Fabrication of conductor will be by Southern Electric and other wire manufacturers. Department of Interior and TVA have been asked to take supplies of conductor to help assure the deal.

D. Loring Marlett, Bonneville Power Administration, substituted for Dr. Paul Raver in discussing current legislation affecting Northwest power development. John Nelson described the Skagit River power development of Seattle City Light and showed a colored motion picture on construction of Ross Dam.

Several panel discussions dealt with operating problems. One on shifting to higher voltages brought out the fact that most agencies already have changed over, or plan to change, to higher voltages. The 7.2/12-kv. wye system is generally favored, although several operators saw the need for going a step higher to 13/23 kv. Robinson, General Electric Co., pointed out that impulse test standards change at 15 kv. and therefore, that transformer manufacturers do not look with favor on the 13/23-kv. system. However, he said that 13-kv. transformers for operation on 23-kv. wye systems are available at slightly higher price than standard ratings and that, if there is sufficient demand, such transformers might of course become a standard. Huff, REA, said 7.2/12 kv. was REA standard, but regrets that they did not adopt 13.2/23 kv. They are now pushing manufacturers to build a 13-kv. transformer for wye operation. Not being able to get such transformers now, they are having to build transmission lines and establish load centers.

A panel on the effect of wage increases sponsored by Paul Hand, Central Lincoln PUD, analyzed hidden labor costs and showed that, because of holidays, vacations, sick leave, etc., outside workers' hourly rates must be multiplied by a factor of about 15.75% and inside workers' rate by 16.7% to obtain true job costs. For different utilities these factors vary from 10 to 19%, he said.

Another panel on development of local hydro sites brought out that up to $200 per kw. can now be spent for small hydro plants to equal the Bonneville rate of $17.50 per kilowatt-year. Still another panel under Owen Hurd, Benton County PUD, dealt with the problem of building up suitable maps for newly acquired properties. The objective of those with this problem is to compile a system map that constitutes a distribution system inventory as well as merely a map showing lines.

S. F. Staples, Employers Mutuals, Wausau, Wis., discussing retirement programs for utility employees, feels that non-profit organizations must have a pension plan in order to compete with private enterprise; also to get top men out of top jobs to make room for younger men.

ELECTRICAL WEST

## Friends in Need

A SHREWD observer of industry welfare remarked the other day that the public relations of electric utilities in the Pacific Northwest were never better. Despite adversities that seem compounded, despite a power shortage that has imposed some rationing, the severely handicapped utilities are enjoying not just tolerance, but the fullest and friendliest cooperation from the public. Any psychologist will say that this is a normal public reaction toward someone who is in trouble. The American people are traditionally sympathetic toward the "under dog." But there is more than this traditionally psychological attitude in the present case. The utilities long ago foresaw the complexities of their potential power shortage. They openly and frankly told the public what might happen. Then they appealed for understanding and cooperation. Is it any wonder then, that irate housewives call commercial customers (even newspapers) and berate them for failing to turn out signs and otherwise restrict power use during peak hours?

## Grass-Roots Approach

FAIR DEAL, new deal or miss-deal—whatever happens in Washington during the next few months (years maybe) will affect the power companies. For that matter, the whole electrical industry will feel the effects of the fall of the cards to the right or to the left. Not only legislation dealing with public power, but taxes, basing points, labor, credit regulations, material allocations and price controls are matters of vital concern to utilities, manufacturers, wholesalers, contractors and retailers.

Hence Washington bureaus and Congress and the Administration will receive more than a little attention. And with some justification. However, we can't help but remind folks in the industry that the so-called "Fair Deal" had its genesis in the people. People—voters—put President Truman in the White House and a Democratic majority in Congress. It was a grass-roots reaction. So we suggest that the industry take a local approach to some of its problems. A man thoroughly familiar with Washington recently said to us, "Business and industry should work from the grass roots up—their problems won't be solved in or from Washington alone." We think that's sound advice.

## Lesson in English

NATIONALIZATION of the electric power industry in England has enhanced rather than diminished the troubles utilities faced at the end of the war. Shortage of power is more acute. Construction of new facilities lags. Rates have been raised to discourage consumption. Taxes have been increased (government operated utilities pay taxes in England contrary to American practice). In fact conditions have reached such a state that the British business press has become extremely critical of government policies. The EEI *Bulletin* reports in detail a number of recent editorials. Parts of two "leaders," as they are called, have a bearing on the electrical business here in the West. The *Electrical Times* says:

> A great deal of deterrent propaganda is undoubtedly having the effect of driving people away from the use of electricity during off-peak hours, in addition to keeping them off the peak. "Switch Off", "Save Electricity" and other similar slogans do not always tie up with the peak appeal; while the inept suggestion of the Clow committee to raise winter tariffs, which was forced on the industry by the ministry of fuel, joins forces with the anti-electricity propaganda to the detriment of the industry. The fact is that, unless a sales effort is made to encourage customers to use electricity and to extol the virtues of electricity as was done in the past, there is grave danger of the various boards failing to secure the revenue which they should be in a position to expect.

Pointing to the increasing perturbation and suspicion on the part of the people in the electrical industry, the *Electrical Review* says:

> When the war finished there was, for a short space, a sufficiency of plant but it soon became apparent that industry would have to continue to operate at the high level reached during the war and that the suppressed domestic demand would have to be satisfied. The Central Electricity Board prepared a programme to meet the situation but the Government decided, partly because of shortage of materials and partly on account of the need for economy in capital investment, that the programme should be substantially reduced. The public have been following an ever-receding carrot. They were first told that supply would catch up with demand by 1950. Since then the date has been advanced several times and now 1954 is being mentioned.

There are potent lessons both for the elec-

# EDITORIAL VIEWS

trical industry here in the West and for the public as well in these two quotations. We have heard about the "dead hand of bureaucracy" stifling initiative, depressing development and impeding growth. The socialized power systems of England prove it. The same thing can happen here in the Far West if, by default, we let complete control and development of our water and power resources fall into the hands of bureaucrats.

## Choking Off Half the Market

WHEN it costs as much to install a device as the device itself costs, the benefit to be derived from that appliance really has to be overwhelming if it is to be justified at all. Certainly only a limited few people are going to be rich enough to buy it for the sheer luxury of possessing it.

The electric appliance that requires a plumbing connection is being pushed into that impossible-to-sell position by the completely unreasonable attitude taken by the plumbers in many localities. In one case the installed cost, including plumbing connections, of an electric sink and disposal was $850 when the sink, dishwasher and disposal cost was less than $400. In another instance, the plumbers in a combination that certainly restrains trade demand a 25% commission on all appliances for which they only connect the plumbing.

Such loading of the cost to the consumer is wholly indefensible. No dealer margin can possibly take up such an overhead charge. If it is loaded on the installation cost, it kills every other sale.

Does the plumber know what he is doing to his own business by such unreasonable demands? He is cutting in half or more the need for his services at all, killing a potentially rich market for installation and subsequent service work. He is also forcing the appliance dealer who wants to sell anything into the plumbing business as a self-defensive side line. And the same is true of the electrical contractor who is not reasonable about installation cost.

Let not short-sighted greed for "protection" or profit cause these businesses to kill a source of new business just coming into its own and which in the long run can bring them much healthier and better results in volume.

*It would be well if the people of this country could understand that the present condition in Europe is not entirely due to war destruction . . . Their present troubles are largely due to the fact that after the first World War all the countries of Western Europe turned socialist. The socialist concepts appeal to all well-meaning people, but the records show that human beings have not developed to a state of unselfishness and brotherly love that will permit a country to adopt these concepts and continue to eat. France is an example worth studying because it has consistently clung to socialism since 1920. The basic idea followed by France has been to redistribute the wealth, regardless of ability to produce. When the government acts to carry out that basic idea, it starts a sequence of events about as follows: (1) Those with wealth who can get it out of the country, emigrate. (2) People in business who find the taxes and other restrictions so great that they cannot make a profit, stop putting money into the business to increase production and many of them go into bankruptcy. (3) Working people who are given laws to reduce hours of labor get the idea that the world owes them a living and their production drops much faster than the drop in the number of hours they work. (4) Production in the country drops to a point where it will not support a satisfactory standard of living. (5) No socialist government has ever balanced its budget. Usually when it faces bankruptcy it devalues the currency instead of taking steps to put the country on a sound economic basis. In 1920 five French francs were worth one dollar. Today it takes 600 French francs to have the purchasing power that five had in 1920. Inflation of that magnitude is ruinous and opens the door to some form of totalitarianism.*—Col. William Kelly, chief of public utility section, OMG for Germany.

A. L. Scaife, G-E merchandise manager, was on hand for the kick-off meeting in Los Angeles to launch Gold Rush Campaign of '49. Scaife and other G-E representatives told dealers of sales and merchandising plans for the year

Three southern California dealers (right) hand over their G-E gold pieces and sign the register at day-long session sponsored by General Electric Appliances, Los Angeles. Booth manned by sales counselors attired as miners of the West

# Gold Rush Contest is Unique

ABOUT 400 southern California appliance dealers charted a course for the Rodger Young Auditorium on Jan. 5 to stake their claim in the Gold Rush Campaign of '49, now being staged by General Electric Appliances Inc., Los Angeles.

They were lured on with teaser mailings, progressive photographs, dealer bulletins, contest information, and even G-E "gold" pieces which were required for admission.

Originated by S. B. Maher, manager of its Los Angeles branch, G-E held the one-day session to brief dealers on details of its four-month Gold Rush Campaign; also to introduce its 1949 appliance line, which was displayed amid an atmosphere of the 1849 Gold Rush.

Big prize being offered is a cross-country tour with all expenses paid to the top 100 dealers. At the time the campaign was announced dealers had already set their first six months' quotas. G-E then sprung the contest idea whereby the top 100 dealers who realize the biggest percentage of their six-months quotas in a four-month period will get a free trip. Luggage awards are being offered to the top 25 dealers earning the largest number of points on home freezers and washers.

Speaking at the kick-off meeting, A. L. Scaife, merchandise manager of G-E, Bridgeport, told dealers that the return to more normal conditions of supply and demand should not give rise to pessimism on the part of business. "The honeymoon is not over," said Scaife, "because in a good marriage the honeymoon should never be over. As long as retail appliance dealers are doing everything they can to please their customers, we are observing a healthy and normal state of affairs. When customers had to line up to buy appliances, this was abnormal."

Chairman of the day-long program was G. A. Lloyd, G-E district representatives primed dealers on point-of-sale merchandising tools and ideas to help them do a better selling job in '49. These men pitched on promotions—C. E. Pickard, home laundry division; J. L. St. Lawrence, refrigerator and home freezer division; H. A. Oliphant, range and water heater division; J. B. Dreyfuss, electric sink and cabinet division.

H. C. Rice, manager domestic sales, Southern California Edison Co., and R. H. Cockfield, manager residential sales, Los Angeles Department of Water & Power, outlined the electric appliance sales potential in 1949.

Advertising plans, both national and local, were explained by R. A. Mays, president of Mays & Co., advertising agency. Cooperative advertising and dealer aids being offered in the campaign were discussed by W. R. Meszaros, manager of the advertising and sales promotion department of the Los Angeles branch of G-E.

R. P. Swanson told about the company's sales engineering program; J. A. Woodruff about its free flooring plan, and W. K. White about G-E's dealer service program.

Dealers will have the chance to participate in a window display service which is being made available on a cooperative plan. These windows, featuring an "appliance of the month," will tie-in with a four-month cooperative newspaper campaign that G-E is running in Los Angeles and San Diego.

## Home Lighting Revived

Long neglected, home lighting was given a sales shot in the arm in the Sacramento, Calif., area through a joint promotion by lighting equipment manufacturers, wholesalers, dealers and the Sacramento Municipal Utility District. It had some of the aspects of the familiar prewar campaigns of the utility companies.

Dealers were contacted and briefed by the Silvray representative, and by lamp company men. They were given a sales training session on the sale of Sight Saver and Vision-Aid screw-in types of domestic fixtures by the Silvray representative, C. T. Bakeman. Lamp company people told them the possibilities for sales and the appeals to use to sell lamp bulbs, with particular stress on the reflector-bowl type of lamp bulb by which to convert ordinary table lamps.

To back the campaign the SMUD ran large space ads in the two Sacramento dailies and six neighboring town weeklies and in the Union Labor Bulletin. These ads illustrated use of the silvered-bowl-lamped fixtures and the bowl bulbs in single-lamp reading lamps. The first ad advised the proper use of light, enough light sources properly shielded and filling of empty sockets with right size bulbs. Advisory service was also offered.

ELECTRICAL WEST

# Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © MARCH, 1949

# How Compensate Salesmen

Growing weary of being told by everybody "you've gotta get out and sell?" Don't blame you. It's obvious to anybody with a bit of sense and an ounce of self-preservation.

The real question you'd like answered is **how.** And if you need salesmen, **what** and **how** shall they be paid.

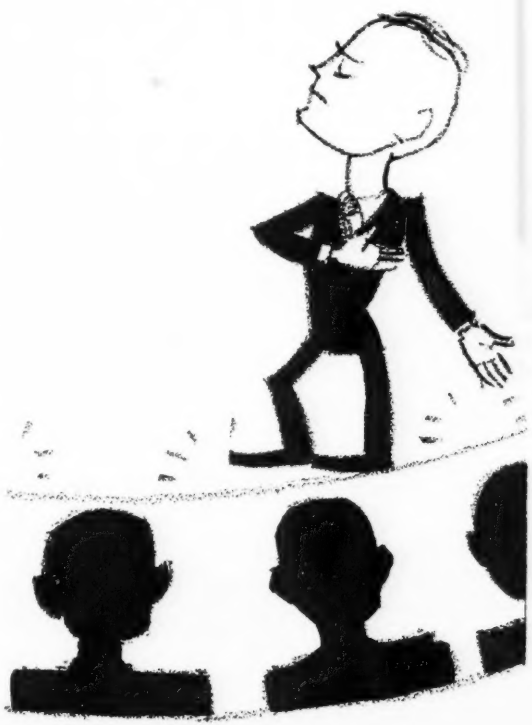
Much of the oratory stops short of such practical details.

Anticipating the need of its dealer members to have practical guidance in what is, to some, an entirely new situation, the Inland Empire Electrical Dealers Assn. has prepared some bulletins on **Salesmen's Compensation.** Its first—a general analysis on the subject by its analytically minded manager, Robert Wilkinson—was printed in full in Electrical West Sales Guide, September 1947.

From succeeding bulletins, with IEEDA permission and blessing, we pass on the follow-up material on this very vital subject. If the time has come to hire salesmen—then this is the time to check one's own business against these recommendations.

As indicated in the first bulletin, salesmen compensation plans providing both fixed income and incentives have advantages which render them most suitable for many electrical stores. Such plans are also more difficult to tailor to individual store needs. Therefore, attention will be devoted primarily to the combination type of plan. Herein are described some of the more practical variations of the combination type of plan. There are some variations and suggestions for tailoring them to individual requirements. Some of the plans are suitable for salesmen selling a variety of merchandise as well as for those specializing in appliances, and for inside as well as for outside salesmen.

Turn the page—



## Variations of Combination Salary and Incentive Compensation Plans

| DESCRIPTION | NOTES | EXAMPLES |
|---|---|---|
| **1.** Commission with guarantee. | Guarantee—$180; Commission—8% | Guarantee paid only when commissions fall short. **Owner control** difficult. |
| **2.** Salary plus commission on all sales. | Salary—$160 per month; Commisison—3% on **all** sales. | Lacking in special incentive to reach a quota. Low sales cost. |
| **3.** Salary plus commission on all sales if quota is reached. | Salary—$190; commisison—2% on all sales if **$2,000 quota is reached.** | Tends to **level earnings** through year. Quota should be low enough for salesman with some experience to reach in slow months if he works hard. |
| **4.** Salary plus commission on sales over quota. | Salary—$125; commission—12½% on sales **over $2,000 quota.** | Most suitable for fairly capable salesmen in **new territories or house-to-house canvassing.** |
| **5.** | Salary—$190; commission—6% on sales **over** $2,000 quota. | Third example too expensive except in an area with relatively little seasonal fluctuation of sales. |
| **6.** | Salary—$250; commission—8% on sales **over** $3,000 quota. | |
| **7.** Salary and "stepped" commission. | Salary—$200; commission—5% on sales **over** $2,000; 7% on sales **over** $3,000; 8% on sales **over** $4,000. | Excellent incentive. Stable sales cost. **May complicate record-keeping** too much. |
| **8.** Salary and commission plus bonus. | Salary—$125; commission—2½% on **all** sales; bonus—5% on sales **over $2,000 quota.** | Might be especially useful for salesmen who work **both inside and outside.** Relatively low sales cost, about the same each month. Second example would be good for some inexperienced salesmen who need fair income during training and slow months. |
| **9.** | Salary—$220; commision—1% on all sales; bonus—6% on sales **over $3,000 quota.** | |

(NOTE: In each of the examples, earnings will equal approximately $250 and sales cost approximately 8.3% at $3,000 gross sales.)

| PLAN | Salesman's Earnings Per Month and Sales Cost as a Percentage of Total Monthly Sales | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. Month's Sales | $1,500 | $2,000 | $2,500 | $3,000 | $3,500 | $4,000 | $4,500 | $5,000 | $5,500 |
| 1. Guarantee—$180; Commission—8% on all sales. | $180<br>12.0% | $180<br>9.0% | $200<br>8.0% | $240<br>8.0% | $280<br>8.0% | $320<br>8.0% | $360<br>8.0% | $400<br>8.0% | $440<br>8.0% |
| 2. Salary—$160; Commission—3% on all sales. | $205<br>13.6% | $220<br>11.0% | $235<br>9.4% | $250<br>8.3% | $265<br>7.6% | $280<br>7.0% | $295<br>6.6% | $310<br>6.2% | $325<br>5.9% |
| 3. Salary—$190; Commission—2% on all sales if $2,000 quota is reached | $190<br>12.6% | $230<br>12.5% | $240<br>9.6% | $250<br>8.3% | $260<br>7.4% | $270<br>6.8% | $280<br>6.2% | $290<br>5.8% | $300<br>5.5% |
| 4. Salary—$125; Commission—12½% on sales over $2,000 quota. | $125<br>12.7% | $125<br>9.5% | $187<br>8.8% | $250<br>8.3% | $312<br>8.9% | $375<br>9.4% | $437<br>9.7% | $500<br>10.0% | $567<br>10.2% |
| 5. Salary—$190; Commission—6% on sales over $2,000 quota. | $190<br>12.7% | $190<br>9.5% | $220<br>8.8% | $250<br>8.3% | $280<br>8.0% | $310<br>7.8% | $340<br>7.6% | $370<br>7.4% | $400<br>7.3% |
| 6. Salary—$250; Commission—8% on sales over $3,000 quota. | $250<br>16.7% | $250<br>12.5% | $250<br>10.0% | $250<br>8.3% | $290<br>8.3% | $330<br>8.3% | $370<br>8.2% | $410<br>8.2% | $450<br>8.2% |
| 7. Salary—$200; 5% on sales over $2,000; 7% over $3,000; 8% over $4,000. | $200<br>13.3% | $200<br>10.0% | $225<br>9.0% | $250<br>8.3% | $285<br>8.1% | $320<br>8.0% | $360<br>8.0% | $400<br>8.0% | $440<br>8.0% |
| 8. Salary—$125; 2½% on all sales plus bonus of 5% on sales over $2,000. | $162<br>10.7% | $175<br>8.7% | $212<br>8.5% | $250<br>8.3% | $287<br>8.2% | $325<br>8.1% | $362<br>8.0% | $400<br>8.0% | $437<br>7.9% |
| 9. Salary—$220; 1% on all sales plus bonus of 6% on sales over $3,000. | $235<br>15.6% | $240<br>12.0% | $245<br>9.8% | $250<br>8.3% | $285<br>8.1% | $320<br>8.0% | $355<br>7.9% | $390<br>7.8% | $425<br>7.7% |

The table on the facing page shows the compensation received per salesman and the sales cost at each of the various levels of total monthly sales for each of the sample compensation plans in the foregoing. With this table you can select a workable compensation plan for your store by using the work sheet below.

# WORK SHEET

By filling out each item on the work sheet in order, you will automatically eliminate all plans which do not provide satisfactory compensation to the salesman or which are too costly for your operation.

1. **Probable monthly sales** (to the nearest $500) which can be made by a satisfactory salesman working under the conditions you plan:

   **(a)** $_____ (Worst Month) **(b)** $_____ (Average Month) **(c)** $_____ (Best Month)

2. **Percentage of total sales** made by the salesman that can be paid him in salaries, commissions and bonuses: (Usually from 6% to 10%, but depending on type of merchandise, richness of market, extent of territory, amount spent on advertising, and other factors.)

   **(a)** Total percentage budgeted to salesman ..... _____%

   **MINUS (b)** Allowance for pay roll taxes, vacations, sickness, etc..... —1.0 %

   **EQUALS (c)** Average allowable sales cost..... = %

3. **Monthly earnings** required by salesman (considering wage scales and living cost in your community, salesman's fixed expenses, etc.)

   **(a)** $_____ (Minimum) **(b)** $_____ (Average)

4. **a.** Read down the column in the foregoing table which corresponds to figure in **1(a)** above (sales in worst month) and select plans which have salesman's **earnings** as high as entered in **3(a):**

   **b.** In column corresponding to **1(b)** (average month), which plans have **earnings** as high as in **3(b)?**

   **c.** In column corresponding to **1(b),** which plans have sales cost not exceeding **2(c)** by more than 0.5%?

   **d.** Circle plans which are **repeated** in 4 a, b, and c.

   **e.** For each of these plans, determine how much the **sales cost** in the column corresponding to **1(a) exceeds** the cost in column corresponding to **1(b):**

   f. Determine how much the cost in column corresponding to **1(c)** is **less than** the cost in the column corresponding to**1(b):**

| | PLANS NO. (Circle) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | ____% | | ____% | | ____% | | ____% | | |
| | ____% | | ____% | | ____% | | ____% | | |

5. Other factors being equal, a plan for which the difference in **4f** is nearly equal to or **greater than** the difference in **4e** should be the most satisfactory plan. Consult the notes following descriptions of the various plans for a further indication of the suitability of the plans you have selected.

## OTHER FACTORS TO CONSIDER

**10% PREWAR —8.3% NOW** Prior to the war, **10% of net sales** was a common figure budgeted to salesman. At that time the average margin on most appliances was about 40%. Therefore, salesmen usually cost **one-fourth** of the total operating margin. If margins now average about 33% of net sales, and cost of salesmen is budgeted on the same basis—25% of the operating margin—the average amount paid each salesman would be **8.25% of his net sales.** The sample compensation plans given on the preceding page were based on an average cost of salesmen of 8.3%.

**AVERAGE VOLUME AND EARNINGS** A sampling of compensation plans in use in electrical stores throughout the Inland Empire indicates that **appliance salesmen in general probably earn an average of about $250 per month.** The average volume of sales per salesman appears to be **about $3,000 per month. The sales cost resulting from these two averages is 8.3%**

—the same proportion of net sales determined above.

**FACTORS REQUIRING LOWER PERCENTAGES** These, of course, are only averages. Some stores provide opportunities for typical salesmen to make higher than average monthly sales without unusual effort by virtue of **heavy advertising; superior locations,** and **means of developing prospects through surveys, services of home economists and other methods.** Because of higher expenditures for these sales helps, **such stores cannot afford to budget an average percentage of sales** for compensation of salesmen. But since salesmen can make higher sales as a result of these other factors, they lose nothing in working for lower percentages.

**FACTORS REQUIRING HIGHER PERCENTAGES** Other stores **may rely primarily on salesmen to develop prospects and stimulate business** in the absence of heavy-traffic locations, large advertising expenditures and other sales aids. **Or they may have brands which do not have wide public acceptance** and therefore take more time and effort to sell. Frequently such brands provide higher dealer margins. These facts permit dealers to pay salesmen higher than average percentages of sales, if volume is high enough to keep overhead expenses in proper proportions.

**CONSIDERING ALL FACTORS** Determination of selling cost, then, must be based partly on an estimate of **the volume of sales a typical salesman can achieve each month.** If he is to compete with high wages in other types of work, the dealer must be prepared to offer the salesman a suitable beginning wage and **opportunities to maintain earnings which will keep him satisfied after he is trained.** On the other hand, the dealer must protect himself against exhorbitant selling costs and must avoid paying the salesman so much guaranteed income **that he will be satisfied to "coast."**

**WILL THE BUSINESS SUPPORT A SALESMAN?** If the estimated average monthly volume of a typical salesman could achieve is so low that an impractical percentage selling cost would result if the salesman earned an average of from $225 to $250 per month, **the dealer probably is in no position to employ a salesman.** (This does not necessarily apply to sales clerks, of course. Clerks who are not expected to carry out all of the functions of skilled appliance salesmen do not require equivalent earnings.)

**BETTER THAN AVERAGE SALESMEN** Naturally, salesmen who accomplish better than average results through extra skill and efforts are entitled to more than average **income and should have opportunities to increase their earnings through incentives** which will not result in increased sales cost.

**THE BEGINNING WAGE PROBLEM** One of the most difficult problems confronted by the electrical dealer in establishing a compensation plan is the setting of beginning wages which provide untrained salesmen with adequate security without burdening the employer with excessive labor cost. The future of individual stores and the growth of the entire industry are dependent to a large extent upon the ability of dealers to attract adequate numbers of potentially well-qualified salesmen to careers in appliance selling. At the present time, however, electrical dealers are confronted with the problem of having to compete, in an era of full employment, with other businesses paying high wages for relatively unskilled work.

When the retail specialty dealer enters this competition in the labor market to employ men to train as salesmen, he is confronted with two special handicaps. First, unlike most other types of workers, an inexperienced retail appliance salesman can produce very few results in return for his earnings during his training period. His wages during training, therefore, involve a considerable investment upon which there is little return. Inasmuch as compensation of the salesman will take a large proportion of the operating margin on the merchandise he sells after he is trained, the dealer cannot expect to recover a great deal of the training investment in the future.

Second, the specialty dealer requires mature, high-caliber individuals, preferably with steadying family responsibilities. Such individuals require the security of fairly substantial beginning wages.

**VETERANS' TRAINING** World War II veterans constitute a large part of the available manpower that can be trained for new jobs. Since they are more mature than most other trainees, often have additional responsibilities, and are more experienced in dealing with people, they are likely to have more immediate potentialities as appliance salesmen than other inexperienced men with equivalent aptitudes and interests.

Since veterans often have had their opportunities to begin training for career fields interrupted by war service, the "G. I. Bill of Rights" and in Canada similar legislation provides that allowances can be paid by the Veterans' Administration to veterans engaged in on-the-job training programs approved by state and federal authorities.

To meet the beginning wage problem of association members and to provide opportunities for promising veterans to receive training as appliance salesmen, such dealer organizations as Inland Empire Electrical Dealers' Assn., Bureau of Radio and Electrical Appliances and others, have prepared and received approval of an 18-month on-the-job training program for appliance salesmen. The training required is largely that which any new salesman would receive while performing the duties of his job. A certain amount of off-the-job training is expected, but this requirement can be fulfilled by attendance at distributors' meetings and training classes; association meetings, salesmen institutes and special training courses, and utility retail sales classes.

Taking the approved IEEDA program as an example, it calls for an objective wage of $250 per month. The training should provide the veteran with sufficient skill to earn that amount or more after 18 months.

A fair basis for determining the amount of overtime pay, if any, would be a percentage of sales over a monthly quota. Normally, the trainee will have to work outside of regular store hours to exceed such a quota.

**(Extra copies of this Sales Guide in reprint form are available on written request)**

ELECTRICAL WEST Sales Guide

# News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

March 1948 ©

As RCA-Victor is about ready to launch its scientific new 45 rpm. record and record player the industry seems to be choosing up sides in the 33.3 vs. 45 rpm. controversy. RCA's researchers have been working for years on "Madam X" who turns out to have a 45 rpm. spin for highest fidelity. But Columbia beat it on the market with its long-playing 33.3 rpm. record. Sales seem to have lagged enough, though, that the player attachments are being marked down and given away with a batch of records. Philco has lined up with Columbia. Capitol however has decided to go along with Victor on 45's. Sonotone Corp. of New York announces a new phonographic pickup that will be made available to the industry which will play all three. And Webster-Chicago says it has a kit to convert its 33.3 rpm. automatic player to 45 for those already having the Webster works. But to add to the already confused record business, suffering from indigestion now, comes word that wire recordings on spools will soon be marketed by Webster. And a newcomer, Eicor, maker of rotary electrical equipment, sprang a new double-track tape recorder to sell at $125 in New York recently.

Groove aches

The "floor model" dodge got quite a workout last month all over the country as ads appeared offering demonstrators and "floor models" of about everything at big reductions. In Las Vegas, according to Tide, one furniture store gave a 2-piece living room set free with a 10 ft. Norge. Anticipating a Bendix trade-in deal, Thor authorized dealers to cut on "floor models" of its washers. Dealers indignantly protested but were shown some of their own ads in classified sections offering similar deals on other makes. It was a month of inventory dumping by just about everybody.

Hardly touch floor

Bendix washers are going after the lower priced market with a trade-in on old washers. And Easy is readying production for a lower priced wringer model. Automatics have gone beyond the reach of low income groups.

Low market

Television was having slow going in San Francisco and Seattle after the first novelty wore off. With a second station, ABC's KGO-TV on the air with test patterns things were looking up in the Bay region. The latter doesn't plan regular programs until May, but finds its tests reach as far as Fresno and behind the Berkeley hills. Southern Calif. Radio & Elect. Appl. Assn. reports 89,337 sets in Los Angeles area Jan. 31; 91% in Los Angeles county; 5 to 6% in restaurants and bars; 3½ viewers per set; one set to each 15 families. San Francisco unit, Northern California Electrical Bureau dealer reports show 246 selling TV, 99 sold sets in January, 143 sold none, 4 no report; 360 sales in January, 1,024 previously sold, 232 not reported last month,

TV flickers

total sales to Feb. 14, 1,616; 51 dealers as yet have made no sales at all. To stimulate selling the Bureau sponsored an afternoon program. In Seattle KRSC-TV reports approximately 3,000 sets sold since Thanksgiving, with sales increasing the last two weeks. One dealer sold 50 sets in one night.

Upped

Lou Berger, Westinghouse Electric Supply Co. district manager, has appointed Harold M. Hansen, former multiple housing manager at Los Angeles, as district appliance manager.

Everybody iron

Ironer Demonstration Week will be a simultaneous demonstration of ironers by all dealers in San Diego county, with a huge fanfare of publicity and ads by the Bureau of Radio & Electrical Appliances, May 2-7.

New offices

N. B. Dinkel, regional manager, Crosley, now has new offices in Western Merchandise Mart, San Francisco, with regional representatives working with him in Seattle, J. D. Crawford, for the Northwest; A. R. Boscow for San Francisco and Salt Lake, and others to be appointed for Los Angeles and Arizona. Glenn Taylor is regional service manager, with Cletus Gochenauer, as assistant specializing in television and radio.

Distributor organization

When Electromaster was taken over by Philco, Alex Kuehlthau, its regional manager, joined Northwest Appliance Distributors as executive manager of its Seattle office, Wallace Campbell, president of Northwest, announced. An affiliate of a big industrial supply company, Northwest Appliance has Seattle offices at 2704 Second Ave.; Spokane at 1015 W. Riverside, where Fred H. Brown is executive manager. A new building in Seattle is in process. John Campbell is its vice-president, Max Schultz, secretary-treasurer. Lines represented include Capehart-Farnsworth, ABC laundry equipment, L & H ranges and water heaters, Deepfreeze, Waste King pulverizers and Frostair refrigerators. Quaker Oil heaters are handled in Spokane.

Sell the middle

G. H. "Rock" Smith, vp. & gm. of Deepfreeze told its Western distributors at a Feb. 28 meeting in San Francisco, that the $3,000-5,000 income group is the largest in America nowadays and it has savings and will buy if sold, but is critical of values for its money. F. F. Duggan, general sales manager summed up after a complete preview of a Deepfreeze cooking school put on by Rhea Shields, home economist. R. V. Newbell, ad manager told of the promotion program. Ben Sanderson, regional manager, was host.

Had you heard?

In the news--Now there's a heated mattress, made by Temperature Products Co. and licensed to mattress manufacturers. Sylcon Corp. of Chicago has advertised it. . . Motorola is suing Admiral for TV patent infringement and copying of its table model. . . Noblitt-Sparks may soon come out with an Arvin TV set. . . Philco is trying to develop an electronic range for radar cooking of food. . . Corning is studying special glass containers for food. . . G-E may soon put Fred Waring's show on television. It is now on radio for the electric utilities. . . Westinghouse is showing a new TV radio-phono console with 10 in. tube. Is also carrying on its experiments with Stratovision broadcasting with Glenn Martin B-2 planes. . . Voice & Vision Inc. of Chicago is offering packaged separate units of TV, radio, phonographs for building in to modern houses. . . Sun Broiler, a table broiler that looks like a pop-up toaster, was shown in New York at W. & J. Sloane. It's made by Sun Specialties Inc. of NY. . . Fresh'nd-Aire Co., Chicago, will market a midget electric fan, 3 lb., at $11.95. . . G-E Lamp Dept. has new whiter inside finish that improves diffusion without loss of light. Electromode has two new room heaters, an automatic with temperature control and a bathroom wall heater.

Califreeze, an 8.2 cu.ft. refrigerator with a freezing space separate, is being manufactured in San Francisco and sold direct from factory to user for $200. Local manufacturer uses radio ads to reach market for direct sales; offers 5-year warranty. — Direct sales

Negotiations with the electrical union in Seattle over several months have reached an agreement with radio dealers for a 15¢ an hour increase from $1.65 to $1.80 with a 15¢ differential for shop foremen. Discussion over television rates will be resumed April 1. — Wages upped

Inland Empire Electrical Dealers Assn. put on a 2½-day intensive salesmen's institute with the assistance of Washington Water Power and the Spokane Trade school. A repeat course for those unable to take the first will be held in March. Condensed into 2½ days the course was thus better suited to out-of-towners who could cover the entire course on one trip. First day's school was set to permit attendance at the general Spokane chapter meeting, at which Herb Zobrist of Seattle spoke and Robert Wilkinson, executive secretary, IEEDA, made an excellent summary of the local television outlook. — Compact course

Sacramento Electric Club and Sacramento Municipal Utility District have worked out a mutually satisfactory prospect allocation plan. — Prospects

NEWA has advised the Federal Reserve Board of its ideas relative to changes in Regulation W that now inhibit sales of radio, television and appliances. As unit production rates have increased the economy of business requires an adequate flow of products to consumers to replace obsolete units, it declares. — Longer terms

Landers, Frary & Clark has introduced its latest Universal oven-type toaster which toasts two slices of bread, one side at a time. Turn of the handle automatically reverses both slices. . . Its new food mixer comes complete with one and two-quart mixing bowls, juicer and strainer. Beater release at forward end of handle can be worked with the thumb. . . Company says it will push its laundry line with a merchandising campaign starting in March and continuing throughout the early summer. Will offer special tie-in offers with washer sales; also dealer promotional materials. — On the market

These facts and figures on electric washers were given by Laurence Wray, editor, Electrical Merchandising, at the second Workshop for Electrical Living presented by the Electrical Women's Round Table Inc.: 25 million women have electric washers in the home. Washers have been selling at a rate of 4½ million machines a year for the past 2½ years. Laundrettes have not cut into the sales of home washing machines, but have convinced more women of the value of washing machines as additions to the home. Other things discussed: detergents and water softeners, skip-cycle washers, ironer and dryer information. — Washer facts

Among appliance displays seen at the San Francisco National Home Show Feb. 26-March 5 were: Ironer demonstrations by Bendix, Ironrite, Maytag and Easy; Westinghouse and RCA-Victor with KPIX telecasts; Mullins and Given with live demonstrations on their garbage disposers; Frigidaire products displayed by Modern House; Califreeze refrigerators selling direct from factory; Norge products; Westinghouse complete line; Lightolier with a girl giving a pitch on Decoralite; California Electric Supply Co. with Crosley Shelvador refrigerators. . . Crowds seemed to be as good or better than last year. Exhibitors indicated more consumer interest was shown. Distributors were taking prospect names for follow-ups by dealers. . . Home Show was held at the Civic Auditorium. Sponsor was the Real Estate Board of San Francisco. . . First show in the series was in Seattle, drawing better attendance and more distributors than last year. Show will go next to Oakland and other Western cities. — Home Show

Summer Market at San Francisco's Western Merchandise Mart will be held August 1 through 6, says Frank K. Runyan, Mart president. — Market week

With the theme "Of Course--It's Electric" Edison Electric Institute has prepared educational materials for an all-electric kitchen program being sponsored by the electric utility industry. EEI is backing the promotion with a 40-page consumer booklet on kitchen planning, wiring and financing called "Kitchenizer's Digest." Another feature is a color motion picture on the subject which will be made available by the utilities for customer showings. Newspaper ads, spot announcements, outdoor advertising, kitchen planning kit and other promotional aids will round out the program. Materials have been designed to supplement the advertising of electric appliance manufacturers. — EEI backing

Duo-Therm is putting out a space heater styled after Chippendale furniture and finished in walnut brown. Company's dual chamber burner and power unit can be installed on either side of the heater. — Period

This spring Proctor will start a merchandising program of direct visual presentation to the consumer by taking its sit-down ironing demonstration into the home through factory trained crews. Sales will be made wherever possible and billed through retail stores. — Direct

Emerson's phono-radio console, model 604, has been increased in retail price to $119.95. Model was introduced in January at a special price of $89.95 for a limited time only. — Boosted

Gibson is pushing a new sales promotion for dealers in the way of a kit containing a tabloid broadside showing Gibson ranges, refrigerators and freezers. To stimulate store traffic the broadside features an offer of a matched set of measuring spoons. Kit also ties-in with the Gibson display and sales training tools. — Tie-in

Modern Utilities Co. is introducing a deluxe flow-air circulator to sell for $32.95. Is finished in a choice of mahogany or grey. Has Underwriters' Laboratories seal. — Deluxe

Telechron says any old clock can be turned in for $1 credit against its new Telarm clock. Dealers and distributors will make their full profit on trade-ins. Are setting up "trading posts" for the promotion. — Old timers

Emerson quotes immediate delivery on its first 12-inch tube television set. Model 618 is a four-in one console combination with FM-AM radio, phonograph and television tube giving a picture about 75 square inches. Retails at $529.50. — Ready to sell

Toastmaster has redesigned its standard model line of automatic electric water heaters in both internal and external details. One change--tank and shell have been made lower and wider to permit installation in limited space. — New look

Frigidaire has added a 26 cu.ft. farm freezer to its line. Has 900 lb. of frozen food capacity. — Big

Motorola is out with a small indoor television antenna which can be used with different kinds of TV sets. Antenna is fitted to a weighted base; can be lenghtened or shortened for best reception. Will sell for $5.95. — TV antenna

Latest room air conditioner of Louis Engineering Co. cools, dehumidifies, filters and circulates the air in a room at a desired temperature. Unit is entirely enclosed. — New

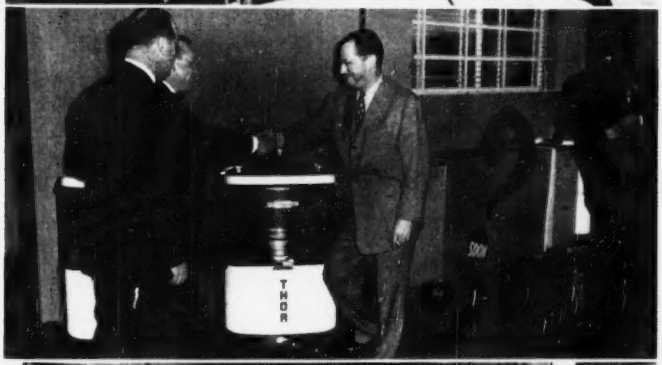
# Western Market Back to Normal

A MEASURE of the same kind of critical and cautious buying that their own customers practice on them characterized the dealers and buyers who came in good numbers to the San Francisco spring market at Western Merchandise Mart, Jan. 31-Feb. 4. No longer desperate for merchandise — any and all—they were more choosey. Because merchandise is not moving out as fast as it comes in, they were likewise cautious about taking on too much inventory, especially the California dealers, for tax on inventories comes in March and no one wanted to pay a lot of taxes for goods standing on the floor. But it was a good market for many. For others not so brisk.

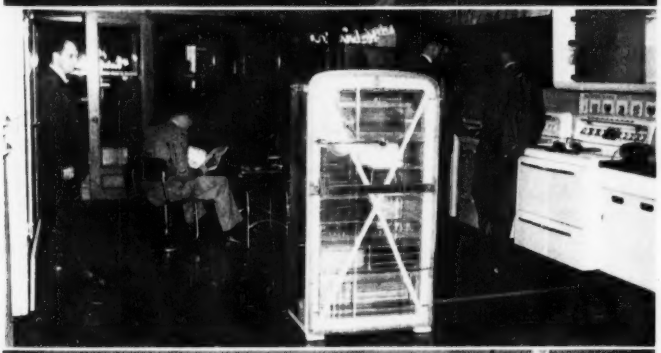
Report was made in last month's News Letter of the new things shown, the highlights of the market. Pictured here are some of the exhibits, indicating as did the market, the predominant interests in television and automatic washers. There was considerable grumbling by distributors about television programs. The pre-Christmas boom in TV sets had slowed down all over. Dealers weren't inclined to put in big orders for sets while those on their floors still sat there. TV had entered the list of wares that now have to be sold.

Television was added to the title of the radio and appliance trade dinner on Wed., Feb. 2, at which H. C. Bonfig, vice-president, Zenith Radio Corp., was the one electrical speaker. H. Carl

H. C. Bonfig, Zenith vice-president, electrical speaker at Mart appliance trade dinner, being introduced by O. R Doerr, PG and E sales vice-president




Thor's new office and display space was approved by Raymond Hurley, Thor president (right). Don Lennard (left) makes it headquarters. Earl Benedict of Houck & Houck, Petaluma (center)



Kelvinator's clear plastic refrigerator showed its works as if by X-ray. In the exhibit were John Pollon, Doug Rogers, Loren Martin, Robert McDonald, of Monterey; M. G. Ponsart, Kelvinator

Keen interest shown constantly over Hotpoint's automatic washer. D. W. Rennewanz, Pacific district manager, and V. E. "Buzz" Koch, right, are happy

Wolf, managing director, American Gas Assn., was the other speaker, and O. R. Doerr, vice-president in charge of sales, Pacific Gas and Electric Co., was dinner chairman.

"Through much of its history," Bonfig said, "the radio industry has been the victim of irresponsible and opportunist operation by a small minority of fringe operators in both manufacturing and retail fields . . . Unfortunately, many of the evil practices that have plagued radio for generations are beginning to show up in television." He went on to say that although "television is radio with eyes," it is more complicated, takes skilful installation and servicing. Hence the need for higher quality, more skilful selling and maintenance. Bonfig also felt that FM radio has not been sold on its superior merits, particularly in the West.

"There is one obligation you must recognize if you wish to stay in the business and get your slice of pie in the sky," he concluded. "Be doubly critical of the quality of merchandise you sell and of the manufacturer's reputation for integrity . . . Know your merchandise thoroughly . . . select and train an efficient sales organization."

Interesting comment in the gas industry talk by Wolf was that last year the advertising programs of both the association and individual gas appliance manufacturers for the first time matched the amount spent by the electric industry on ranges and cooking. The gas industry intends to fight for every range and water heater sale in 1949, he made it evident.

Aside from the market dinner, the new appliances and television sets shown market week usually bring factory executives from whom vital information about conditions is sometimes obtainable. Raymond J. Hurley, president of Thor Corp., brisk, plain spoken, witty and friendly, met the press at an informal conference and answered even the touchy questions as to prices, wage increases, seasonal layoffs, steel supply, price cutting. With

Fred Fenton, Easy's Western manager, enthused over new water filter model of Spindryer to William Culner, Levy Bros., San Mateo, Calif. (seen at left)

Record album space in Packard-Bell radio combination can later be used to place television unit, as C. A. Duffy of Wallicks and Norris Teakle explain

Getting at the very root of things was E. Buchanan, Rio Vista dealer, at Pioneer Appliance exhibit of new Blackstone automatic laundry ensemble. Others are J. W. Hamilton, Guy Mainwaring, Art Driskell and Frank Parker

HERE'S A TYPICAL TEST
ONE OF 486
THAT WESTINGHOUSE FLUORESCENT LAMPS PASS
A phosphor crystal functions at top efficiency in a fluorescent lamp when its atoms are united in a definite pattern. Here a Westinghouse scientist tests mixtures of new phosphors in the Research Laboratory at Bloomfield, New Jersey.
That's Why Westinghouse Fluorescent Lamps
WORK SO WELL
BURN SO BRIGHT
LAST SO LONG
WESTINGHOUSE
YOU CAN BE SURE...IF IT'S
Westinghouse
THE NAME YOU KNOW IN Lamps

factories in England and Canada, he was also able to give informed inside views as to conditions in the rest of the world. Prices cannot come down much as long as material prices and wages stay high, particularly if factories have to go on "start-stop" operations. Break-even point is high these days. Price cuts may come from dumping. It has not produced volume, however. Steel is still a problem. The cement case decision has pulled many steel people out of any but their own local market. A "fourth-round" of wage increases is being drummed up. But, said Hurley sagely, "You can bleed a company just so far and then you are out of a job." He feels that more emphasis will go into ironers and dishwashers now that more companies are making them.

Altogether the market this year was more a "normal" one than the trade has known for the war years.

# Sell the "Go-With" of Home Fixtures

THE almost forgotten art of selling lighting fixtures for the home can be revived. It is by no means a lost art. These were conclusions reached after Ted Berk, vice-president and merchandising manager, fixture division, Lightolier, Inc. of Jersey City, had awakened a lively interest in the subject at a meeting of fixture dealers and electrical contractors called by California Electric Supply Co., San Francisco, during Berk's recent visit to the West. E. L. McDonnell, vice-president of the supply company, distributor of the line, was complimented by Berk for the exceptional showroom of home lighting fixtures, available to its dealers, to assist them in selling.

He explained that fixture stylists at the factory aim to give their creations the "go-with" that will enable fixture dealers to sell lighting equipment for the home; fixtures that will *go with* the decorative scheme and furnishings of that home. Illuminating engineers work with designers to control and shield the raw light for comfort and seeing. Fixtures so designed are style creations and price is no longer a consideration in their sale. Fixture allowances today are at an irreducible minimum. Trying to meet such prices is wasted effort. But a "new look" can be sold. Style and "go-with" can make price unimportant.

The industry has been selling "an empty box" when it sells a "nice fixture for $1.98," Berk said. Empty boxes, he went on, are hardware items that go down or up. But really selling lighting fixtures that go with decoration and furnishings takes skill and gives pleasure. A customer may never before have bought a fixture in her life. Unlike a dress or furniture, she knows nothing about it and is seeking authoritative advice from the dealer. If every customer is treated like the "13th customer" who is given attention and understanding of her needs, she will send the other 12 to buy on her recommendation.

One interesting point Berk made was that if a contractor or dealer cannot make the original sale of fixtures to a new house, he can always go back to it to sell replacement of cheap, inferior fixtures with those of real quality. He described how one dealer in New Jersey had a trailer fitted like a room and equipped with sample fixtures. He drove it up the streets of houses built before the war, parked outside, and invited housewives to come out and see the trailer display; handed them literature and cards. He found that nobody had made any effort before to make women conscious of lighting fixtures. He never went near a new house, said Berk. But he made a good business from old houses. Interest in his trailer exhibit grew so that he even had to make appointments to have it on certain streets on certain days. Called his trailer a "Lightmobile."

As a pattern for selling fixtures from a showroom, one learned from long experience and against the competition of others, Berk advised that a salesperson should sit the customer down comfortably, discuss her home and needs, the various rooms, types of furnishings, decorative scheme, ceiling heights, have her describe her silver pattern, linen, dishes. Thus the salesperson builds a relative value for the lighting fixtures in keeping with the silver, dishes, glassware, furnishings, etc. Fixtures sold in that way create a value and pride of ownership in lighting equipment that makes for satisfaction and more sales.

Ted Berk, of Lightolier, speaking, below, told dealers the opportunities in sales of quality home lighting fixtures. Seated beside him, is Sol Cohn, in charge of lighting, California Electric Supply, and at right is the attractive exhibit at last year's Home Show in San Francisco, presented by California Electric Supply Co. Fixtures for kitchen, dining, bed room and living room were shown in appropriate "go-with" surroundings to crowds of home-interested visitors

# R&M's UP FRONT in the '49 FAN PARADE!

## NEW MODELS promoted by 40,000,000 Messages in the Post!

*"Pedestal"*

Adjustable height, 38 to 62 inches from floor to center of fan. Beautiful gunmetal finish. Attractive, telescoping, chromium-plated and gunmetal column. Wide, quiet blades. Totally enclosed oscillating mechanism. Guaranteed five full years. Sixteen-inch, 2 speeds. **$58.95,** retail.

## Meet the R&M Line For '49!

**Smart new styles, attractive new finishes, and *trade-up-priced* for bigger-dollar dealer profits. Yes, beautiful new *name* merchandise, plus everything you need to sell it. Think of it! Ten ads in *The Saturday Evening Post* for a total of 40,000,000 messages. That's 4 million messages each and every week for ten solid weeks beginning May 28!**

**But wait, there's more! Colorful consumer folders, window and shelf strips, complete newspaper ad mats, fan cuts—all at no cost to you. And all this selling support topped off with a co-operative advertising allowance you'll really like!**

**So get all the facts . . . today . . . now. Write for "Fan Promotion Kit." *Robbins & Myers, Inc., Fan Sales Div., Springfield 99, Ohio.***

**ROBBINS & MYERS, INC.**
**SPRINGFIELD 99, OHIO**
**BRANTFORD, ONTARIO**

CASH IN ON AN AD A WEEK FOR 10 WEEKS IN THE SATURDAY EVENING POST

*"Quiet De Luxe"*

Large, ultra-quiet, overlapping blades. New gunmetal-enamel finish. Distinctive cadmium-plated guard. Die-cast body and base. Oscillating mechanism totally enclosed. Guaranteed five full years. In 12- and 16-inch sizes. Three speeds. Wall bracket included. From **$44.95,** retail.

*"Quiet"*

Wide-blade, high-price design at a popular price. Handsome-bronze-lacquer finish. Sturdy die-cast body and base. Enclosed oscillating mechanism. Guaranteed one full year. In 10-, 12-, and 16-inch blades. Two speeds on 12- and 16-inch. With wall bracket, from **$19.95,** retail.

*"Breeze-All" Floor Fan*

Durable, mottled-mahogany plastic cover and band. Chromium-plated legs and grille. Safe from top, bottom, sides. Doubles as extra seat or table. Extra-low-cost operation. Rubber-mounted motor is quiet. Twelve-inch, 2 speeds. **$47.95,** retail.

*"Home Cooler"*

It's *portable*, sets into open window. Appealing to *home-renters* and owners alike. Ultra-quiet, no belts, no pulleys. Clean ivory finish. Only 6½" deep. In 24- and 30-inch blades. Adjustable stand available for 24-inch model. Guaranteed one full year. Three speeds. From **$97.50,** retail.

# PANORAMA OF THE PCEA

Edited by A. X. Schilling

## Convention At Coronado

ARRANGEMENTS for the annual spring convention, to be held May 25, 26 and 27, are shaping up rapidly under the guiding hand of Marshall C. Wells, Sues, Young & Brown Inc., general chairman. The Hotel del Coronado, at Coronado, has been named convention headquarters.

Unlike recent conventions, this year's gatherings will meet for the first general session after noon, at 2:30 p.m., on Wednesday, May 25. This departure from the customary morning opening will prove more convenient from the transportation standpoint, especially for northern delegates. The afternoons of May 26 and 27 will also be devoted to general sessions, with parallel sessions scheduled for Thursday and Friday mornings.

Plans are being made for buses to meet the four trains from northern California the morning of May 25 to take northern delegates directly to the Hotel del Coronado on time for the opening session that afternoon.

The Business Development Section will meet as a unit on Thursday and Friday mornings. The Thursday morning session will feature industrial and commercial topics, while the Friday morning session will be devoted to domestic electrification. All electrical dealers in the San Diego County area will receive special invitations to attend the Friday session, which will be designed to be of particular interest to them.

The Administrative Services Section will meet as a unit on Thursday morning, with speakers keynoting a theme such as "What management will expect of various departments if, and when, the business cycle levels off." The first speaker, a representative of utility management, will establish the theme and will be followed by a recognized economist who will discuss current economic trends. The concluding speaker will be a representative of the personnel group who will apply the theme to personnel problems.

On Friday morning, the Administrative Service Section will meet in four separate groups: accounting (including treasurers), credits and collections, personnel, and purchasing and stores.

The Operating Economics Section will meet on both Thursday and Friday mornings in eight separate groups: steam generation, hydro generation, transmission and distribution, substation, meter, transportation, communications, and safety.

The cocktail party sponsored by the manufacturers, manufacturers' agents and wholesalers, will be held late Friday afternoon, followed by the annual banquet and dance. Dress for the banquet and dance is expected to be formal for the ladies and optional for the men.

The annual golf tourney and competition for the Bylesby Cup, Pelton Cup and Addison B. Day Cup will be conducted on Saturday, May 28. Numerous additional prizes will be presented for low gross, low net, first and second flights and a number of blind bogey events.

Organized luncheons on Thursday and Friday will feature speakers on topics of timely interest to delegates, and the ladies will be invited to attend luncheons and entertainments specially planned for them.

The ladies luncheon on Thursday probably will be served on board during a boat trip around the bay; the Friday luncheon for the ladies is being planned in conjunction with an aquatic show at the hotel pool. Optional for delegates and their ladies will be a trip to Tijuana, Mexico, Thursday evening, with dinner at the Jai Alai Club, where the thrilling game of jai alai may be witnessed.

General chairman of this year's convention is Marshall C. Wells. Chairmen of the various committees are: William deWaard, San Diego Gas & Electric Co., stage manager; D. D. Smalley, PG and E, attendance; J. A. Long, Southern California Edison Co., banquet; A. I. Benedict, San Diego Gas & Electric Co., golf; H. G. Dillin, San Diego Gas & Electric Co., hotel; Paul Corriere, San Diego Gas & Electric Co., ladies entertainment; R. G. Kenyon, Southern California Edison Co., program; A. X. Schilling, Southern California Edison Co., publicity; O. R. Doerr, PG and E, reception; C. C. Potts, Westinghouse Electric Corp., registration; S. R. Robinson, San Diego Gas & Electric Co., transportation; S. W. Scott, Graybar Electric Co., ushers, and Harold Q. Noack, Phelps-Dodge Copper Products Corp., cocktail party.

## Institutes

Institutes in Los Angeles and San Diego similar to the Electrical Living Institute now being conducted in San Francisco under the auspices of the Home Economics Committee will be conducted later, it has been decided. It was found impractical for the southern sessions to be conducted concurrently with those in San Francisco, but that they eventually will be conducted has been assured by the school cooperation that has been offered.

The Electrical Living Institute began on Jan. 26 with a registration of 130 persons. The next session, on Feb. 2, drew 262. The classes meet each Wednesday evening for 15 meetings, excepting during Easter week, and will conclude with a trip through a PG and E generating station.

Classes are held in the PG and E auditorium, San Francisco, and are directed primarily to home economics teachers. The course has been approved by school departments in San Francisco and the East Bay area for two units of teacher-in-service training, and accepted by the University of San Francisco for two units of college credit, upper division education 130.

## Section Recommendations

During the President's Advisory Committee on Jan. 13, J. S. C. Ross reported for the Business Development Section that the section had two recommendations that it wished presented for the consideration of the board of directors. The first recommendation was that a commercial and industrial lighting committee be appointed with an original assignment of developing a practical plan for the maintenance of lighting installations. The other recommendation was that a high-frequency heating committee be established to accumulate and dis-

# APPLETON DISKONECT REFLECTORS

Pat. No. 1,993,385

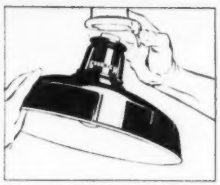
## *the most practical* DETACHABLE REFLECTORS *ever made!*

Here's Appleton's answer to the ever-present problem of installing and servicing light reflectors quickly and easily. The Diskonect Reflector is attached or detached from the hood instantly by means of a snap lock—without twisting, tugging, forcing or the use of tools. The heavy drawn-steel hood is fitted with a spring-set lever which locks or unlocks the porcelain enameled reflector.

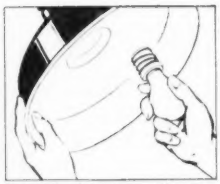
Even when the Diskonect Reflector remains in place for extended periods, detachment remains quick and easy. Corrosion and "freezing" together of component parts are prevented by metal-to-glass connection—heavy, rustless cadmium plate to porcelain enamel.

Diskonect Reflectors are finished in permanent porcelain enamel and offered in a wide variety of styles. Complete "come-apart" construction permits cleansing of all parts separately a time-saving feature that enables you to maintain a higher standard of lighting efficiency.

## 5 SIMPLE STEPS FOR EASIER SERVICING

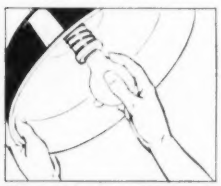


Release spring-set lever. Reflector and lamp are detached instantly, as a unit.

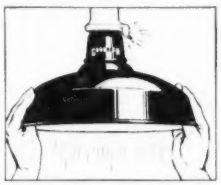


Lamp and socket are removed together. Slight upward pressure and a quarter turn remove them from reflector.

Reflector may be immersed in water for thorough cleaning to restore original reflecting surfaces.



Socket and lamp are returned to reflector and securely locked with merely a simple twist of the wrist.



Pressing reflector into hood, locks reflector in place, lights lamp, again delivers full illuminating efficiency.

*SOLD THROUGH ELECTRICAL WHOLESALERS*

**APPLETON ELECTRIC COMPANY**

**1709 WELLINGTON AVENUE • CHICAGO 13, ILLINOIS**

**LOS ANGELES 12, 100 N. Santa Fe Avenue**

**SAN FRANCISCO 1, 655 Minna Street**

**SEATTLE 9, 115 Ray Street**

**DENVER 2, 1509 Seventeenth Street**

**USE THIS CONVENIENT BUYING GUIDE**

*A fully detailed and graphically illustrated Appleton Catalog will be mailed to you immediately upon request. Be sure to have one and use it for faster, easier—completely dependable purchasing of all lighting and electrical equipment.*

iA, 1017 Cherry Street

APPLETON ELECTRIC PRODUCTS

# APPLETON

**CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES • EXPLOSION-PROOF FITTINGS • REELITES**

seminate information on commercial electric cooking, the heat-treating of metals and similar subjects. It was suggested that this committee investigate the desirability of having industrial representatives confer as a means of informing one another regarding the latest developments in electric high-frequency heating.

## New Directors

During its meeting on Feb. 10, the board of directors welcomed H. B. Sargent, president of the Central Arizona Light & Power Co., who had been appointed a director to succeed M. G. Sanders, and appointed H. F. Hartzell, president of Maydwell & Hartzell, as a director to bring the board up to its full membership of 20.

The board also expressed its appreciation of the booklet published by the advertising committee and authorized the committee to prepare a similar report covering the convention this May.

### EMEA

Electrical Maintenance Engineers Assn. of Southern California has elected Homer M. Evers, McCulloch Motors Corp., as president during 1949. Harold S. Davis, General Electric Co., is the new first vice-president; Frank J. Rohring, Southern California Edison Co., second vice-president; Ray C. Gunning, Larsen-Hogue Electric Co., secretary-treasurer. New members of the executive committee are Paul A. Shrader, consulting engineer, and Ralph Weston, City of Culver. Holdover members are William H. Slater, Earl Mollenkoph and Bob Paden.

Third Annual Industrial Electrical Show, scheduled for March 24-26 at the Shrine Convention Hall in Los Angeles, is the big event planned for the year by EMEA of Southern California.

San Francisco's modern traffic signal system was shown with slides and a floor demonstration by Charles Schardin, Department of Electricity, City of San Francisco, at the Feb. 17 meeting of EMEA of Northern California.

Local sections and divisions of the EMEA, AIEE, IRE, Instrument Society and other technical groups in the West programmed a number of meetings from December through March featuring the General Electric display of electrical measuring devices.

Following a brief presentation of principles and practices, electrical devices for a wide range of measuring applications were demonstrated in operation. The display, under the direction of J. M. Whittenton, sales manager of G-E's electric instrument division, also included a special collection of oscillographs, which was added only for the West Coast showings of a nation-wide tour.

### IEA

Stanley M. Johns, manager, Westinghouse Electric Corp., Salt Lake City, will head the Intermountain Electrical Assn. for 1949. Other officers include J. F. McAllister, Utah Power & Light Co., vice-president, and James L. Schricker, General Electric Supply Corp., secretary-treasurer. Directors from each branch of the industry were also elected. At its annual meeting recently Howard W. Price, retired president, gave a resume of the association's activities during the past year.

### Electric Clubs

At its Feb. 14 meeting the San Francisco Electric Club elected D. D. Smalley, P. G. and E. Co. vice-president, as president for this year. J. R. Lazarus has been retained as secretary-treasurer. W. E. Nagel, J. S. Rose and Everett Carlson were elected to the board of directors.

President of California Wholesale Electric Co., Harry C. Chapman, presented a technicolor motion picture at the Feb. 14 meeting of the Electric Club of Los Angeles.

Talk and demonstration on overload protection of 3-phase motors was given by Frank Miramonte, supervising technical engineer of Pacific Gas and Electric Co., at a recent meeting of the East Bay Electric Club.

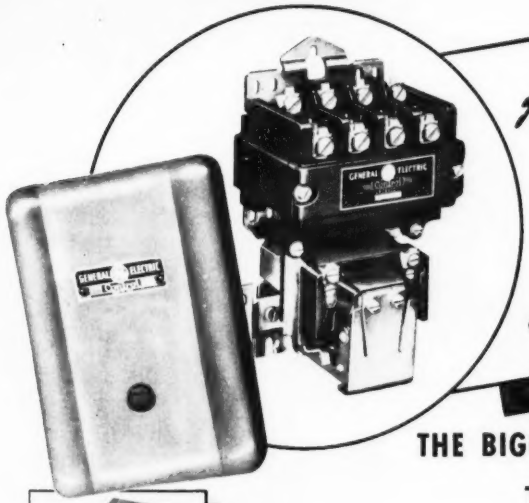
Sacramento Electric Club has changed its meeting place to 5723 Folsom Blvd . . . At its Feb. 16 meeting F. M. Sandusky discussed the Sacramento Home Show, and C. T. Bakeman talked on residential lighting. The adequate wiring program of the club was also outlined.

President D. O. Bergey turned over the gavel to the new president of the Portland Electric Club, Ralph Stoufe, at the first meeting of the new year, which featured installation of new officers. Lee Wright was chairman of the day, and W. G. Meyer, program chairman. Franklin Griffith was honored at the meeting also.

### AIEE

With a talk on steel and electricity as the key to Western industrial growth, G. E. Stoltz, consulting steel mill and metal working engineer for Westinghouse, Pittsburgh, addressed members of the power division of the Los Angeles Section, American Institute of Electrical Engineers. Stoltz, who has just returned from Europe, is scheduled to give similar talks at AIEE meetings in San Francisco, Portland, Vancouver, B. C., Seattle, Spo-

Officers of Electrical Maintenance Engineers of Southern California: at left Henri Ledeboer, giving his report upon retiring as president. New executive committee: Frank Rohring, Ralph Weston, W. H. Slater, Harold Davis, Bob Paden, Homer Eversz, new president, Ray Gunning, Paul Shrader. Earl Mollenkopf, another director, was not present



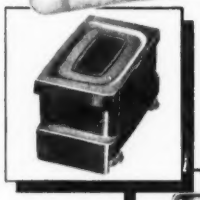
*Announcing . . .*

# A COMPLETE NEW LINE of GE Motor Starters

## THE BIGGEST CONTROL STORY IN YEARS!

### THE G-E FULL VOLTAGE MAGNETIC A-C STARTER with the STRONGBOX MAGNET COIL

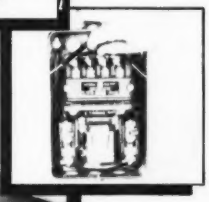
Used to start, stop, and provide overload protection for full voltage A-C motors under the most exacting conditions. Designed for extra long life, easy maintenance!



Strongbox —toughest coil ever!

**TOUGH NEW STRONGBOX MAGNET COIL**

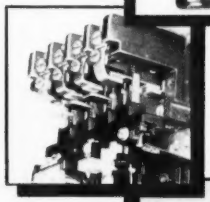
Proof against water, dust, oil, screwdrivers, magnet coil is sealed in a plastic block . . . solventless varnish holds its Formex* windings in place. The silicon-steel magnet, with channel reinforced guides, moves easily against permanently lubricated Strongbox coil unit.



Easy to inspect contacts

**EASY TO INSPECT OR CHANGE**

Contacts are easy to inspect, easy to change—quickly exposed . . . plenty of wiring room . . . large panhead screws to give maximum bearing surface for screwdriver.



Plenty of room for wiring

**DEPENDABLE OVERLOAD RELAYS**

Precision isothermic heater elements maintain continuous guard over loads . . . allow modern motors to operate up to full, safe load . . . easy two-screw replacement.

Dependable overload relays

**LONG LIFE, EASY MAINTENANCE**

New features include: fine silver tip extra heavy construction contacts . . . easy-to-switch manual or automatic reset . . . contact springs permanently attached to contacts to prevent loss.

Available in NEMA sizes 0, 1, 2 and 3; also with circuit breakers or nonfused motor circuit switches in place of fuses.

*Trade-mark Reg. U. S. Pat. Off.

## GENERAL ELECTRIC SUPPLY CORPORATION

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SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

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PROOF

FROM

MINNESOTA

# "We saved 750 service calls with 'CSP'"

Nowhere does the built-in thermal protection of the "CSP"* Completely Self-Protecting transformer offer more conclusive evidence than this statement of a midwestern operator:

> A total of 2,641 distribution transformers are in service; 1,967 are Westinghouse "CSP" units, 674 are conventional types.
>
> From July 31, 1941, through December 31, 1947, the utility made 303 service trips for transformer outages caused by thermal conditions:
>
> 271 were made to conventional transformers; 32 were made to "CSP" units.

The record becomes more striking when the figures are reduced to a unit basis. Conventional transformers required one service call for approximately every two units. "CSP" transformers required one service call for every 60 units! If the "CSP" transformers had shown the same rate of outages, there would have been 750 more calls over the six-year period.

One sure fact stands out: the built-in thermal protection of "CSP" transformers cuts service costs. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

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**Trademark—Reg. U. S. Pat. Off.*

*PROVE IT YOURSELF* with this new book that lets you compare Completely Self-Protecting transformers with conventional types—using your own figures for original investment, installation maintenance, depreciation and interest. Ask for B-4247, "Transformer Costs and Their Relation to Profits".

*Call the Westinghouse Salesman*

**Westinghouse "CSP" TRANSFORMERS**

SINGLE PHASE THREE PHASE BANKED SECONDARY

kane, and Salt Lake City. He was also guest speaker at the Feb. 28 meeting of the San Francisco Electric Club.

San Francisco Section of AIEE had P. G. Caldwell, chief engineer, American Broadcasting Co., as guest speaker on its Feb. 8 dinner meeting. Caldwell outlined the engineering aspects of television in California.

University of California Society of Electrical Engineers, joint branch AIEE and Institute of Radio Engineers at Berkeley, have elected the following officers for the spring semester: chairman, Lindon G. Criddle; secretary, AIEE, Donald E. Frye; secretary, IRE, Robert L. Ellsworth; treasurer, Frederick A. Peck. R. M. Saunders remains as counselor.

A refresher course for electrical engineers has been developed by the Richland Section, AIEE, educational committee under Chairman W. J. Dowis, in cooperation with Dean F. Ellis Johnson, in charge of the G-E Hanford Works educational program. Dr. W. Varner of Oregon State College will be in charge of the course.

The course is designed primarily to prepare electrical engineers for the Washington state professional engineering license examinations, but will be of interest to those wanting a refresher course. It will meet for 19 evening sessions starting Jan. 19 in Richland. Tuition fee of $13 will cover expenses.

First half of the course will review circuit principles and a-c and d-c machinery theory. The last half will include lectures by outside specialists. Practical problems will be assigned to bring out points covered during class lectures.

## IEEDA

Two more chapters of the Inland Empire Electrical Dealers Assn. have elected officers and directors for the coming year. Fred W. Denson will head the Big Bend Chapter, with T. H. Bonk as vice-president; Fred J. Williams as secretary; Berdell Hose, Winn Self, W. E. Snyder, Ray Souther, and Thomas Underwood, directors.

Palouse Chapter president will be Claude Edgren; Willis Shaver, vice-president; L. A. Winn, secretary; Russell Tate, treasurer; and S. C. Haddock, Joe Brunzell, John K. Howard, and Frank Williamson, directors.

## Pot & Kettle

San Francisco Pot & Kettle Club bade goodbye to its past president, Arthur J. Hitt, before the latter left to join his brother at Los Angeles in appropriate P & K fashion, Feb. 11. Hitt's "life history" was dramatized for him and the club by Fred C. Wood and D. J. Bartelme. Bruno Kaufner, Hazel Atlas Glass Co., succeeds Hitt as pseident. R. E. Happoldt advances to first vice-president, George L. Hall to second vice-president, Milton Albin, Hardware World, to treasurer; Walter Stone, Wm. P. Horn Co., corresponding secretary, and Max P. Fisher, H. Q. Wilson Co., recording secretary. At the Feb. 18 meeting, Walter E. Lind, Pacific Gas and Electric Co., spoke of "A Quarter Century of Industry Cooperation."

## NECA

An additional field representative for the Northwest has been appointed by National Electrical Contractors Assn., E. R. Cornish, director, Pacific Coast office, announced. John A. Majerus, with address at 2457 55th St., Seattle, will work in the Washington and Oregon area, particularly in western Washington. Majerus has had labor relations and personnel experience in war industries, is acquainted with construction industry people and problems and is familiar with association work.

Next District 6 meeting of NECA will be held in Spokane sometime in May, Cornish announced, probably the weekend of May 20-22. Date of the meeting had not yet been settled upon pending arrangements with Paul Geary, executive vice-pre ident and S. J. Cristiano, director of labor relations, from Washington, D. C., headquarters to attend. They will be at the District 5 meeting at El Paso, May 9-10.

Southern California Chapter elected Sid Hill as its president, Max Fry, vice-president, A. L. Stone, treasurer, and Howard Stolper, governor, at its recent annual meeting. Warren Penn is manager. The former governor, J. B. Shamel, is now District 6 vice-president.

Southern California Chapter is one of the sponsors of the big National Home and Building Exposition which is scheduled for June 2-12 at the Pan-Pacific Auditorium, Los Angeles. Bigger than last year a third more exhibit area will be provided out of doors adjacent to the auditorium. A. D. Stone, treasurer of the chapter, is also treasurer of the construction industry group sponsoring the exposition.

San Francisco Electrical Contractors Assn., Inc., an NECA chapter, returned to office all of its officers at its recent annual election. The vice-presidency, vacant due to the death of Victor Lemoge, was filled by Roy Crooke, of C. A. Langlais Co., a board member, and Fay Lemoge, son of the late Mr. Lemoge, placed on the board. W. B. Baker, who has had a successful and harmonious administration, was re-elected president; Ed F. Dowd, treasurer, and Ed Scott, secretary. W. J. Varley is manager. Clyde Chamblin is NECA governor.

Northern California Chapter elected Cecil Searle, Santa Cruz, as its president; Wm. Bassett, Conrad Electric Co., Oakland, vice-president; W. A. Cyr, treasurer, and Dan Bronson, California Electric Co., Oakland, governor, at its annual meeting, held in Oakland late in January. A. S. Henderson, president last year, on behalf of the Fresno and Visalia branches, asked for and was granted the lower San Joaquin valley territory for the formation of a new chapter, separate from the Northern California chapter. A controversial finance committee report made by Ed Buttner, its chairman, precipitated a long discussion and a new committee, headed by T. L. Rosenberg, was appointed by Searle to review the situation and report at the next quarterly meeting.

Seattle Electrical Contractors Assn., a NECA chapter, elected Colton Green as its president to succeed Kalman Brauner. Don Close is vice-president, Charles Mars, treasurer, and Ralph Lane, governor. R. D. Horning is manager. The Seattle association has new quarters in the same Arctic building, with more room for its offices and facilities.

S. I. Jagger was elected both president and governor for the Oregon chapter at Portland; W. R. Grasle, vice-president, and F. E. Webb, secretary-treasurer. Lawrence C. Rodgers is manager and the office is now in the new Oregonian building.

San Joaquin County chapter, at Stockton, Calif., has elected J. E. McCarty, Brite Spot Electric Co., as its president; R. Gould its governor; E. R. McGinnis, vice-president; Ray Parker, treasurer. E. H. Grogan is chapter manager.

San Diego County chapter elected V. "Tommy" Heinz as its president at its annual meeting. He succeeds L. G. McDonald, La Jolla Electric Co. A. C. Eddy is vice-president, Wm. Davies, treasurer. The governor is to be selected later. Pete Montgomery is manager. Norman D. Ferguson has been chapter governor for the past year.

California Conference of NECA Chapters named two co-chairmen to lead it in 1949. J. D. O'Conner, Lupen & Hawley, Sacramento, had been its chairman since its formation. He will remain as chairman of its legislative committee, but the chairman ship will be taken either by R. Goold, Stockton, or Dan Bronson, Oakland. Wm. Welsh, Sacramento Valley Chapter manager, will remain the secretary

# Cole Electric Co.

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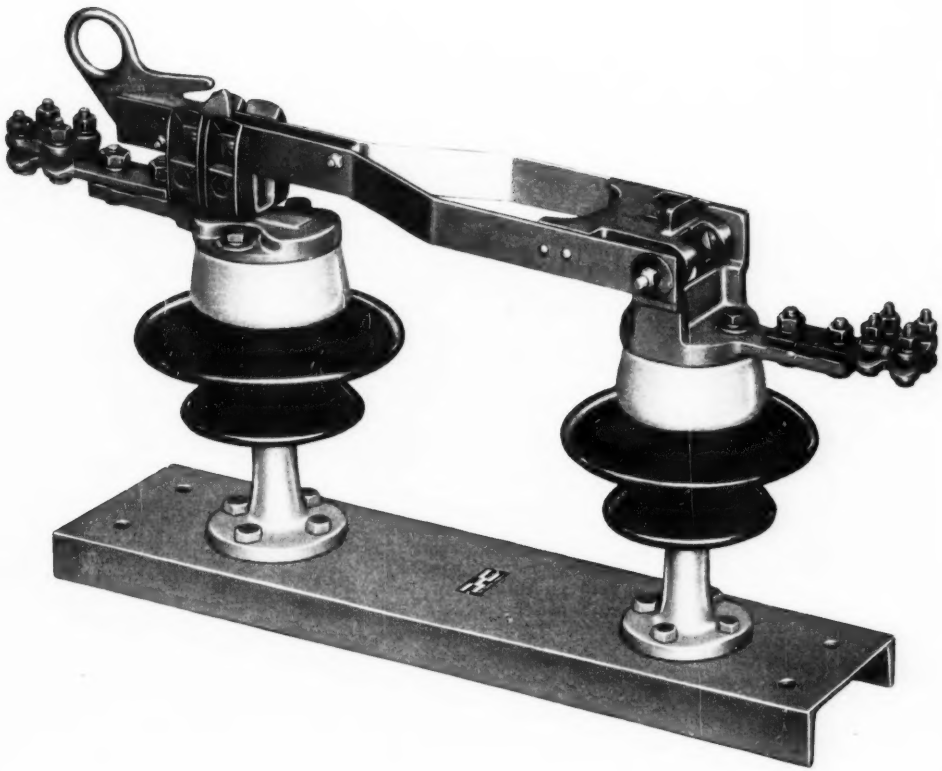


OUTDOOR HOOK STICK
DISCONNECTING SWITCH
15,000 Volts - 400 Amperes
Type Y2
Single Pole - Single Throw
Cap and Pin Insulators
See Bulletin 20 A

for the conference. At its last meeting in San Diego the conference acted to enter a brief as friend of the court in the Harney vs. California State Contractors License Board case. The suit has been brought to remove requirement for a technical examination and separate licensing by a contractor of any classification in order to do electrical or plumbing contracting.

### J. Scott Milne Talks

For the first time in ten years there is manpower available all over the U. S. and the construction business is starting a decline. Both union and contractors working together must find ways to cope with the situation in a constructive way and not let the decline become a depression. Such in two sentences was the heart of the extraordinary message which J. Scott Milne, international secretary, International Brotherhood of Electrical Workers, gave to a large meeting of union members, officers and electrical contractors, at Oakland late in January. The joint meeting was sponsored by Northern California Chapter, National Electrical Contractors Assn., and arranged by Ed Buttner, Scott-Buttner Co., Oakland, now NECA labor committee representative for District 6. Buttner presided at the dinner. Oscar Harback, who succeeded Milne as IBEW District 9 vice-president, in introducing Milne, paid tribute to his leadership in the 20 years since he went to Tacoma in union organization work.

Milne had recently returned from a trip to Europe, having visited his father and sister in Scotland, and conferred with labor movement officials in England, France, Germany. He gave a powerful picture of the devastation and the poverty and want of the people in Europe. He came back disillusioned over the socialistic state in England. Although the capitalistic system had many faults, Milne was emphatic in saying it was much to be preferred to socialism. Public ownership of everything makes the unions part of the state also and leaves labor in no position to deal at all with it. Actually the labor government, he said, has very few laboring people running it. The leaders are mostly politicians that have affiliated themselves with the labor party and now run it.

There were many significant statements made by Milne regarding the relations between the union and contractors. They covered the areas of judisdiction in line construction work, the apprenticeship joint responsibility, the standards of workmanship in union membership, the pension benefit program, holding on to present wage and hour standards instead of making more demands in the face of declining construction activity, facing unemployment problems constructively, why the union wants contractors to do profitable business instead of chiseling and other similar subjects. More of his complete address will be published in a later issue. He also denounced the Taft-Hartley Act in beginning his address, urging union members to write their congressmen opposing it.

### NCEB

An entirely different type of dealer meeting, more in the nature of a clinic or job study conference, is being started in Northern California Electrical Bureau territory by LeRoy Bennett, manager of activities. The first was held at San Jose, Feb. 14, another at Monterey Feb. 15. Three more were scheduled for early March, one at Belmont, March 1, Woodland, March 7, Stockton, March 8. Bennett uses a series of charts to analyze the factors making for successful operation of a business and provokes discussion among the dealers present. The session is frank and outspoken yet always kept constructive. With long experience in selling at both the dealer and distributor levels, Bennett knows the answers.

Henry M. Sigvartsen, The Emporium, San Francisco, was elected president of the San Francisco unit of the Northern California Electrical Bureau at its annual meeting on Feb. 11. Serving with him will be George W. Baack, Record Merchandising Co., vice-president; C. P. McCarthy, Pacific Gas and Electric Co., secretary-treasurer. Chairman are: appliance section, Joseph C. Purcell; educational section, D. J. McClellan; lighting section, Garth A. Chamblin; radio and television section, George W. Baack; wiring section, Everett W. Carlson.

### IES

Mother Lode Chapter of Illuminating Engineering Society has a lighting course underway. Classes are restricted to 40, and IES members given enrollment preferences. Started on Jan. 18, the course will continue through April 5. Classes of two-hour duration include sound slide films, motion pictures, slides of outstanding installations, as well as demonstrations of light sources, control methods and basic principles. Meetings are held at the Pacific Gas and Electric Co. auditorium in Sacramento . . . Dinner meeting of the chapter held late in January featured R. "Bob" Thallon, illumination engineer, PG and E., on the subject *Dramatic Examples of Spectacular Lighting.*

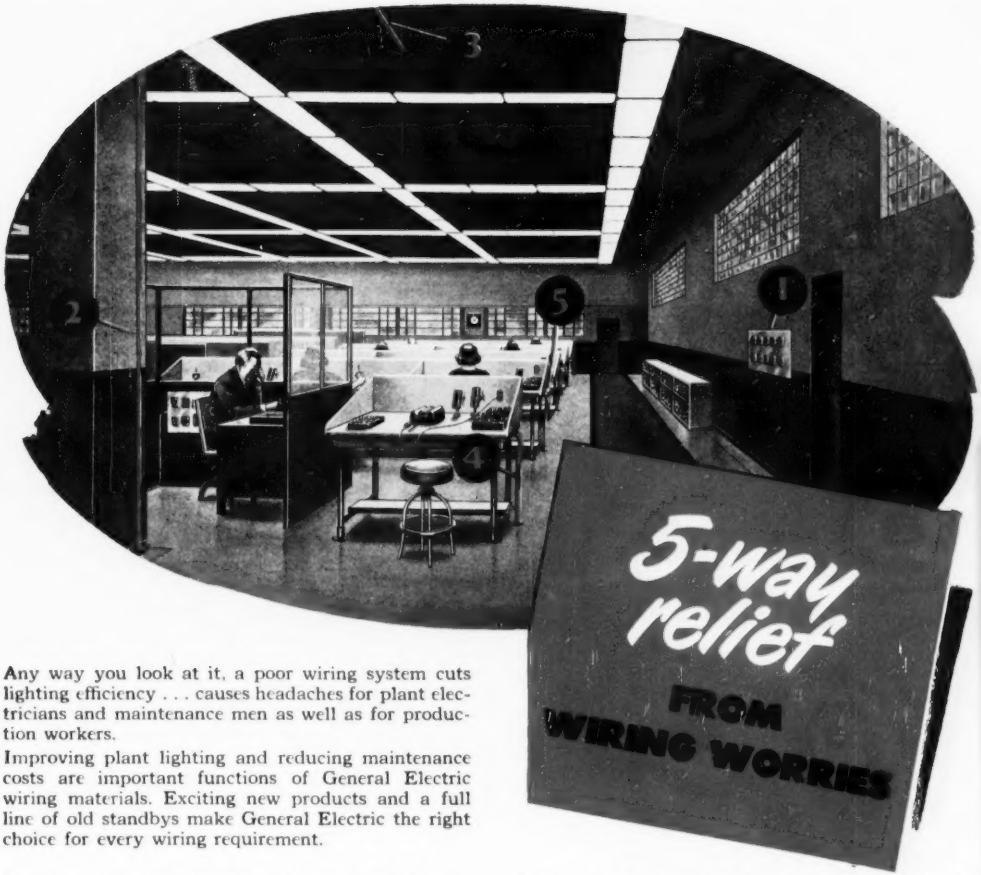
Plans for continuing "lighthouse" research to provide more usable light in school classrooms, offices and other workplaces were outlined by Robert W. McKinley of Pittsburgh Corning Corp. Research Laboratory at a recent Oregon Section meeting of IES. McKinley, former editor of the IES Handbook, said that studies in bending daylight with glass blocks were interrupted during the war, but declared that plans for a new postwar "lighthouse" of glass are being completed . . . At a luncheon meeting of the Oregon Section on Feb. 16 Leonard A. Hobbs, vice-president and general manager of Smoot-Holman Co., explained the RLM label to members, including RLM's plans for the future.

IES fellowship certificate was presented to Dean L. M. K. Boelter of the University of California by Frank Hansen at a recent meeting of the Southern California Section. IES . . . Traffic safety lighting in Los Angeles, what it has done and what it can do, was discused by Ralph T. Dorsey, traffic engineer, at the Feb. 2 meeting. Extra feature on the program was a brief talk by Leonard Hobbs, Smoot-Holman Co., recently returned from the annual NEMA and RLM Institute meetings . . . For its following meeting the section has scheduled a talk on aviation lighting, arranged by Roy Dahlin, and to be held at the Civil Aeronautics Authority headquarters, Los Angeles municipal airport.

*Southern California Lighting Progress*, a compilation of information and pictures on unique lighting applications in data sheet form is now taking shape, according to the Southern California Section, IES.

Pacific Northwest regional conference of IES, at Portland, Multnomah Hotel, March 10-11, will hear the same national speakers scheduled for the San Francisco conference, March 3-4; President Lee E. Tayler, Don Caverly, Dr. Rarell Harmon, G. B. Buck II and Dr. A. E. Kidd, A. L. Hurley of Vancouver, J. W. Greenlaw, Winnepeg; James McCullough, Charles Long, Los Angeles, Beverly Travis, Seattle, David Mozes and T. R. Anderson, are programmed for local papers. Jerry Collins, Portland General Electric Co., is in charge of the conference; T. W. Fitch of the hotel reservations. Tours of the two new newspaper plants, the PGE street lighting laboratory, and of the Catholic Grotto are planned also.

Northern California Section heard Wm. J. Varley, manager, San Francisco Electrical Contractors Assn., tell what he felt was the contractors place in illumination. Varley maintained that contractors could handle engineering as well as installation.




Any way you look at it, a poor wiring system cuts lighting efficiency . . . causes headaches for plant electricians and maintenance men as well as for production workers.

Improving plant lighting and reducing maintenance costs are important functions of General Electric wiring materials. Exciting new products and a full line of old standbys make General Electric the right choice for every wiring requirement.

1. **NEW G-E REMOTE CONTROL** wiring puts switches for various lights in many convenient locations. Master panel can be located at production head's desk. Banks of switches can also be located at convenient points in the shop for local control. This flexible, new wiring system also permits control of any or all lights from distant locations, such as other offices or a master-control point. The G-E remote control wiring system makes multi-point switching economical and easy to put in.

2. **G-E REMOTE CONTROL WIRE**—lightweight, with two or three conductors—was specially designed for remote control wiring. This trim-looking wire can be installed either concealed or exposed—makes a neat installation when it's run along wall surfaces. It permits remote control switches to be placed practically anywhere. The use of a low-voltage relay makes this small-size wire practical.

3. **AVA POWER CABLE** is a natural for bringing in power to a high-level lighting installation like this. And, when you think of power cables, think of General Electric Deltabeston* cables. They'll save you maintenance grief, because they're built to beat ambient and operating heat. They can help you save space, too, because they are designed to carry more current than ordinary cables of the same size.

*Trade-mark Reg. U.S. Pat. Off.

4. **TYPE TW WIRE** is recommended for installation in raceways. Smooth-finished G-E Type TW can be cut and stripped with little effort—pulls through conduit easily when wiring changes are necessary. Small diameter and long life are features of this G-E thermoplastic wire—use it to help your wiring system stay modern.

5. **CONDUIT,** of course, should be General Electric "White"—the rigid conduit that's *hot-dip* galvanized for extra protection. High-grade steel—galvanized inside and out, and lacquer-coated—gives you maximum wiring protection with a minimum of maintenance. Remember to specify "G-E White."

Your distributor of General Electric construction materials can supply you with any of these materials, or with any of thousands of other items from the General Electric line. For more information, contact him, or write to Section K17-325, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

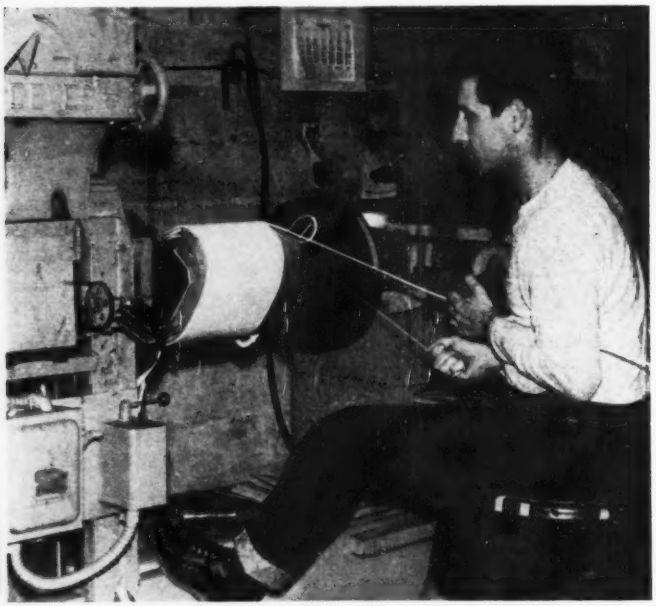
GENERAL ELECTRIC

## IAEI

An almost impossible situation of confusion and conflicting rules exists between various agencies of local and state government as respects protection from hazards in places of public assembly, such as theaters, hospitals, schools, etc. This was the conclusion reached after Harold L. Gerber, consulting engineer and former inspector, reported for a committee studying the problem for the Northern California Chapter, International Assn. of Electrical Inspectors. Work of the committee was voted to be continued. At noon, of its last meeting, the chapter heard Dr. Carrol of Stanford University, discussing high-voltage transmission and a study of dielectrics sufficient to restrain such voltages. In the afternoon session, among inspectors problems, Delbert Hansen of Oakland advocated use of No. 6 instead of No. 8 wires for ranges because of higher wattages and to allow for future increases. Walter Keller, Santa Cruz city inspector, was elected chairman to succeed James Ambrosi of Oakland. Ben Wiesinger of San Francisco was named vice-chairman and Ken Bliss re-elected secretary-treasurer. Next meeting will be held at Alameda, March 19.

Trailers are found to have electric ranges, water heaters, space heaters these days, it was reported among inspectors problems at the last meeting of the Southern California Chapter, IAEI, at Southgate. It was presided over by George Tansey, chief of Los Angeles Electrical Division. Wide divergency of practice was also reported among the inspectors in dealing with the trailer installation. Temporary power assemblies used by contractors at the building site were also discussed and utility company representatives agreed to request inspectors' approval tags and yearly inspection of such assemblies. It was decided to have a permanent committee in the chapter to answer code questions as a regular feature of meetings. New service requirements of utilities will be made the main topic at the next meeting, at Long Beach, May 25.

Central California Chapter, IAEI, met at Freno, Feb. 5.



**Both the coil design and the actual winding** of every Gardner transformer hold flux leakages and other losses to a minimum. Gardner engineers and the men who work under their direction never lose sight of the basic necessities of efficient transformer operation. A Gardner transformer is always built to so nearly as possible give power output equal to power input. Gardner Transformers Guard Profits.

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GARDNER TRANSFORMERS GUARD PROFITS

## BREA of SDC

Twenty-three manufacturers who produce supplies and devices for home wiring exhibited to some 150 contractors and wholesalers, city inspectors and wiremen at the unique electrical contractors division meeting of Bureau of Radio & Electrical Appliances of San Diego County, Feb. 11. Meeting program itself had a wholesalers' panel, chairmanned by Art Vesco, city electrical inspector, a dealers' testimonial session on the best ways to create adequate wiring business, and a humorous skit by Bill McKinley, wiring specialist for San Diego Gas & Electric, and Alan McCutcheon, lighting consultant. Color slides of typical adequate wiring jobs recently installed were also shown. Bert Reynolds, contractor, was chairman of the meeting . . . New sales training advanced course begins in March for those who have taken the ABC basic training course. Other activities soon to be announced are a home freezer promotion, dates for the 12th annual electrical and home appliance show, and a second annual sales clinic. The electronics division also has a program coming up soon. The electric bed covering campaign in January and February sold twice as many blankets and quilts as were sold a year ago.

## Appliance Dealers

Hal Soden has been named president of the Association of Appliance Dealers, Seattle, succeeding Wally Watts, who recently resigned. The association held its first meeting of the year in the form of an informal session to discuss the appliance business.

*"Give us the tools . . ."*

# *McGraw-Hill Surveys* BUSINESS NEEDS

**If it can get the money American industry in 1949 will go full steam ahead with a vitally-needed program of improving its facilities. This program since V-J Day has kept business expanding and has made belated headway in modernizing industry.**

**Furthermore, if it can get the money American industry will carry on for the next five years with its unprecedented program of expenditure for new plant and equipment. Plans already made call for spending about $55 billion.**

These are findings of the McGraw-Hill national survey of "Business' Needs for New Plants and Equipment." Major results of the survey, which have been rechecked since election day, are summarized on the following page. They report what American industry is now planning to spend for new plant and equipment. *They do not and cannot show what will be done if the plans are hamstrung by political action.*

*In 1949, the survey shows, American industry plans to spend $14.1 billion for new plants and equipment. That is only about 5% less than was actually spent in 1948.*

If these plans are carried out, actual capital expenditures this year may be somewhat larger than they were in 1948. That is because expenditures usually prove to be larger than planned.

Fulfillment of American industry's plans for investment in new plant and equipment this year would no doubt mean a continuation of general prosperity. The record shows that when capital expenditures are high general business thrives.

Even more remarkable than the 1949 prospect is the fact that:

**Industry already plans to spend $41 billion in the years 1950-53 to improve its plants and equipment.**

Plans tend to taper off, of course, as they are pushed further into the uncertain future, five years from now. But the striking fact is that plans for expenditures so far ahead are as great as they are. They show American industry's need for tremendous improvements in its plants and equipment.

Again, let there be no mistake. These survey findings are not a five-year forecast. They report what leading corporations now are planning to do – *if they can get the money.*

*But – won't industry be top-heavy with plants and equipment if it carries through any such program?*

The answer is clearly – "No".

Here are some of the reasons why not that were disclosed by the McGraw-Hill survey:

First, manufacturing industries are shifting emphasis from expansion to improving efficiency.

They have increased their total capacity 56% since 1939. Their expenditures in 1948 went almost 50-50 for expansion and improvement. But in the next five years they plan to spend three-quarters of their funds to replace and modernize facilities, only one-quarter for expansion.

Second, the prospective rate of expenditure for new plant and equipment is relatively low.

Planned expenditures for new plant and equipment in 1949 represent about 7.5% of the present value of all plant and equipment. That rate of capital expenditure is no higher than the rate during previous periods of prosperity. And industry must overcome years of starvation for new equipment, caused first by the depression of the 30's, then by diversion to war production.

Third, industry is following an extremely cautious policy in buying new equipment.

Three out of four companies report that they will not buy equipment unless it will pay for itself within five years. And a third of the companies report that they expect new equipment to pay for itself within three years. The reason most frequently given for such expectations was that all the money available can be spent on equipment which does pay for itself quickly.

**The program of capital expenditure planned by American industry is one of the greatest bargains ever offered to the American people.**

To pay for itself in a few years, as equipment must if most companies are to consider buying it, that equipment

continued on next page

## WHAT THE SURVEY SHOWS

● HERE ARE THE MAJOR FINDINGS of McGraw-Hill's survey of "Business' Needs for New Plants and Equipment". Rechecked since Election Day, results show what industry is now *planning* to spend for new plants and equipment. They do not forecast what will actually be spent. The survey shows:

1. Industry now plans to spend $14.1 billion in 1949 – and almost $41 billion in the four years beyond, 1950-53.
2. Manufacturing industries alone plan to spend $7.2 billion in 1949. This is 7.5% of the estimated value – $96 billion – of all manufacturing facilities.
3. Manufacturers estimate conservatively that it would cost $136 billion to completely replace their facilities with the most modern plants and equipment available.
4. Postwar expansion is virtually complete in most manufacturing lines. Major exceptions: steel and petroleum refining.
5. Expansion programs of railroads, utilities, and oil companies still have two to five years to run.
6. Manufacturing industries have increased their capacity 56% since 1939. But expansion is slowing down. Increase planned in the next five years is only 13%.
7. Efficiency is emphasized more and more in planning new facilities. Manufacturers plan to devote almost three-quarters of their funds to replace and modernize. In 1948, 58% went to increase efficiency this way.
8. Equipment should pay for itself in five years or less, say three out of four manufacturing companies. New buildings, say 77% of them, should pay out in 15 years or less.
9. Profits and reserves are counted on to pay for new buildings and equipment by three out of four manufacturing companies. Some 15% expect to borrow, only 9% plan to sell stock. However, 20% would like to sell stock, only 4% want to borrow.
10. More liberal depreciation allowances for income tax purposes would prompt almost two-thirds of the companies to speed their purchase of new plants and equipment.

● A copy of a complete report on "Business' Needs for New Plants and Equipment" may be obtained by writing me at McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y.

must promise to produce much better products or make great savings in labor and material. The savings go first to the companies buying the equipment but, as they always have, they soon spread to everyone in the form of better products at lower costs.

*Where does industry expect to get the money to buy this bargain for the American people?*

Most of the companies covered by the McGraw-Hill survey (76% of the total) count on their own resources – largely profits – to pay for new plant and equipment. About 15% of them expect to borrow money, although only 4% like the idea of getting saddled with fixed debt. Only 9% of the companies expect to sell stock to investors, although twice that many report they wish they could.

*What are the chances that business can get the money?*

The survey provides no answer to that question. No survey can.

The answer will come from Washington – in what Congress does about taxes on profits and taxes on the millions of Americans who might invest a part of their income in industry's new plants and equipment.

The answer will be found also in the energy and skill shown by investment bankers, particularly in mobilizing the resources of the millions of Americans whose incomes have increased enough since 1940 to make them potential direct investors in industry.

Still another important part of the answer will be given by labor leaders. About half the companies surveyed by McGraw-Hill are holding back on new construction – primarily because of high costs. What organized labor does about wages and productivity can swell or shrink that percentage.

**The McGraw-Hill survey leaves no doubt that American industry is fulfilling its responsibility. It is planning the capital improvements needed to make the nation secure, prosperous, and progressive.**

But business today lacks confidence and badly needs added incentives. Proper taxation and increased depreciation allowances are vital if we are to open the capital markets to finance industry.

What will happen now depends in large part on what is done in Washington. In his State of the Union message, the President said that "business should plan for steady, vigorous expansion." But in his budget message he proposed new taxes which would divert a substantial share of the money industry is using for expansion and improvement. Moreover, he said nothing about the vital issues now freezing the capital markets.

It is not possible to have it both ways. Fulfillment of the President's tax program means cutting industry's program for new and better equipment. It means slowing down industrial progress. It means delaying the advance toward much higher standards of living tomorrow in order to have a little more government spending today.

**I urge you to see that your Representative and your Senator have all the facts on industry's needs for new plant and equipment. What they do to this program will have a decisive bearing on the nation's security and welfare.**

James H. McGraw, Jr.

*President, McGraw-Hill Publishing Company, Inc.*

*This is the fourth editorial of a special series on industry's needs for new plants and equipment – and what these needs mean to all Americans.*

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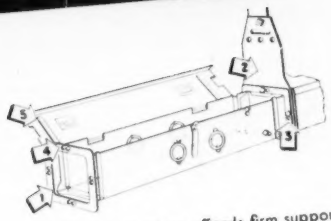


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# THE MONTH IN BRIEF

### Bill Would Legalize PUD Combine

Labeled by some observers as the real "blue chip" power bill of the present Washington state legislative session, the nine-line House Bill 322, if enacted, would permit any two or more PUDs to act together in acquiring an entire private power system. It would give such a combine all the powers granted to an individual district except the right of condemnation, taxation or creation of subdistricts. It would legalize such deals as the attempted Skagit County purchase of the Puget Power system for a group of PUDs—a plan blocked by the state supreme court in 1947. At least one PUD was numbered among opponents of the bill last month. Whatcom County PUD commissioners declared it "dynamite laden" and "dangerous"; pointed out that it could make their own unit or others absolutely powerless to stop a deal engineered by any two PUDs. Whatcom reportedly is critical of the latest Puget Power purchase plan of Guy C. Myers, claiming that it sets up fantastically high prices for the system.

### Fish Sanctuary

The Washington legislature passed and Governor Langlie signed into law the bill to reserve streams tributary to the lower Columbia as a fish sanctuary. The new law will prevent the city of Tacoma from building projected hydro dams on the Cowlitz. (EWEST, February, p. 154.) In Oregon legislative bills propose: withdrawal from appropriation waters of the Metolius and Deschutes (would block Pelton Dam project); slight reduction of the portion of the Rogue withdrawn (would allow California Oregon Power hydro project).

### State Power Commission Proposed

House Bill 270 introduced in the Washington legislature last month provides for a five-man state power commission, with authority to acquire generating facilities and transmission lines by lease, contract purchases, construction or condemnation. It could not condemn publicly owned facilities, however. Acquisition of Grand Coulee and other federal facilities by negotiation and purchase is provided. The commission would be required, in general, to sell the state-owned power at wholesale and could cooperate in flood control, navigation and reclamation projects. It would have the authority to set up rates and make interchange agreements. The bill is backed by Governor Langlie, who asked in his inaugural address for greater local control of hydroelectric resources. Before introduction of the bill, Mayor Devin of Seattle proposed such a commission as an alternative to a CVA.

### Electrical Administrative Commission

House Bill 56, sponsored by the Electric Club of Washington, would create an electrical administrative commission; provide for establishment by the commission of minimum standards for installation of electrical wiring, equipment and devices; authorize licensing and examination of electrical contractors, electricians, retailers, with fees to be placed in a special fund for administration of the act.

### Co-op Jurisdiction Argued

Hearing on a bill to remove electric cooperatives from corporation commission jurisdiction was before the Arizona House of Representatives last month. Co-op leaders claimed that, unless the law is changed to eliminate commission control and more clearly define the scope of co-op functions, cooperatives cannot survive. Power company representatives accused the co-ops of violating an agreement made two years ago; contended that, if co-ops were removed from commission control, they would obtain an unfair advantage over private power distributors because they would be operating under a different set of rules.

### Another Power Cut in B. C.

In its second conservation order, closely following the Jan. 20 directive (EWEST, February, p. 134), B. C. Electric cut industrial power use 30% under a PUC-approved rationing plan. The cut applied to all industrial customers except sawdust-fuel operations of lumber mills.

### California to Ontario

Experience counts, and so when the Hydroelectric Commission of Ontario, Canada, began its monumental task of changing customers' equipment from 25 to 60 cycles, California Electric Co. of Los Angeles was given the contract to change appliances, as it had done in the Southern California Edison Co. changeover recently finished. J. B. Shamel, proprietor of California Electric, just returned from Ontario where details were worked out.

### Steel Tower Jurisdiction

Who shall erect steel towers, linemen or steel erectors? This jurisdictional controversy is reaching deep into the AF of L headquarters for some kind of settlement. International Brotherhood of Electrical Workers secretary, J. Scott Milne, declared firmly that steel transmission tower erection was part of the electrical system, and they had always done it. Steel unions claim it is theirs. The problem is facing Bonneville Power Administration which has a number of steel tower lines scheduled to be erected soon. BPA doesn't care who does it, so long as it gets done, but quick; wants the unions to settle jurisdictional questions and go to work.

### What's New in House Wiring?

Do electrical contractors know all the latest in house wiring? To help them see, feel and learn about new home wiring materials and devices the Contractors Division of the Bureau of Radio & Electrical Appliances of San Diego County held an extraordinary table-top display meeting in February. All wholesalers and manufacturers of wiring materials and devices installed by contractors in the home were invited by the joint contractor-wholesaler committee to show what they had of interest to all the house wiring contractors in the county. Sales possibilities in wiring were told in the accompanying program.

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# THIS MONTH'S NEWS

## ENGINEERS REPORT HAS HEARINGS IN NORTHWEST

The Army Engineers' "308" report on development of the Columbia River Basin met general approval at public hearings last month in Seattle, Spokane and Portland. At the Boise hearing the $3 billion program was opposed as costly, wasteful and inefficient by representatives of Idaho Power, California Pacific Power and a delegation from Baker, Ore.

Seattle's hearing gave virtual endorsement, with objections confined to minor features and the proposed Glacier View Dam in Montana, which would flood 19,500 acres of national park and fish and wildlife. At Spokane, the only witness to oppose the entire report was a spokesman for Montana Power Co., who said that his company and Utah companies differ with most Washington and Oregon power companies on the need for more power.

At Portland, fishing interests declared themselves not opposed to the building of upstream dams, if the federal government can guarantee on an indemnity basis that the salmon runs will not be destroyed. A representative of the Columbia River Salmon & Tuna Packers Assn. objected to the lack of data in scheduling proposed projects and asked that the program be scheduled so as to spare the fishing industry as long as possible.

Discussion of President Truman's request for a Columbia Valley Authority was specifically eliminated from the testimony at the hearings, although some witnesses attempted to introduce it. At Seattle, Major General R. C. Crawford declared that his organization is interested only in the physical and engineering phases of any authority and is opposed to CVA.

The voluminous report is a revision of the "308" report published in 1932 and is the result of a review started in 1943. It consists of the Main Control Plan, a system of levees, multiple-purpose reservoirs and navigation improvements; (2) modification and extension of the Willamette Valley project; (3) other subbasin plans for flood control, navigation and irrigation. Associated plans are (1) necessary extension of the Bonneville transmission network; (2) the lower Columbia River fishery plan of the Fish and Wildlife Service; (3) an expanded hydrometeorological network to furnish data for the operation of multipurpose reservoirs; (4) soil and forest cover programs of the Department of Agriculture. A plan to reimburse local governments for tax loss is included.

Installation of more than six million kilowatts of additional hydro generating capacity is provided. Immediate authorization is asked for Libby project on the Kootenai River in Montana; Albeni Falls project on the Pend Oreille in Idaho; Priest Rapids on the Columbia; Hells Canyon on the Snake in Oregon and Idaho; John Day and the Dalles projects on the Columbia. Glacier View project on the Flathead is included for consideration.

After review of the testimony by the Board of Engineers, recommendation is made to the Chief of Engineers. If the recommendation is favorable, a report is submitted to the Secretary of the Interior and the governors of states concerned. Governors have 90 days to make recommendations.

## USBR to Put Alaska Hydro Project Before Congress

Proposed Eklutna hydroelectric project near Anchorage, Alaska, soon to be presented to Congress by the Bureau of Reclamation, estimates that the power load in the Anchorage area will reach 175,000,000 kwh. by 1958.

Of this total, the Anchorage domestic, commercial and industrial load is expected to account for 62,000,000 kwh. Joseph M. Morgan, chief of the Bureau of Reclamation's Alaska Investigations Office, estimates the direct savings to power purchasers at $748,000 annually.

The production of power is expected to repay the reimbursable portion of the project in 52 years at 3% interest based on the sale of 96,000,000 kwh. at 8.5 mills per kwh. and 41,000,000 kwh. of secondary energy at 4.3 per kwh. each average year.

Total estimated cost of the project is $31,580,900, with the power project estimated at $30,365,400.

● APRIL 15 is the deadline for entries for the Planned Lighting awards sponsored by the Edison Electric Institute and the Better Light Better Sight Bureau.

## DISTRICTS ASK PERMIT FOR STANISLAUS DEVELOPMENT

South San Joaquin and Oakdale irrigation districts have applied to FPC for a 12-month preliminary permit for a reservoir and power project on the middle fork of the Stanislaus River in central California. A preliminary permit does not authorize any construction and gives no assurance that a license will be issued.

The two irrigation districts propose to construct a 285-ft.-high rock-fill dam having a crest length of approximately 730 ft. and a side spillway about 200 ft. long or a concrete variable radius arch overpour dam. The structure, to be designated Donnells Dam, would create a reservoir with a surface area of 413 acres and gross capacity of 64,500 acre ft. at maximum storage level.

A 30,000-ft. tunnel would be constructed between the dam and power house. Plans call for installation of vertical multinozzle impulse turbines directly connected to vertical 60-cycle 3-phase generators in the power house. The maximum static head would be 1,360 ft. The two districts estimate that the power plant will have a peak capacity of 48,240 hp.

Electric energy generated by the Donnells project would be sold at the switchboard to the Pacific Gas and Electric Co.

## Salem Council Reduces Tenure of Cooperative

Before passing an ordinance granting a franchise to Salem Electric, a cooperative, the Salem, Ore., city council adopted an amendment reducing its tenure from 20 to five years. The ordinance, making effective the franchise voted the co-op at last November's election, permits operation in any part of the city where a majority of the residents petition for its service.

Portland General Electric Co., which serves the Salem area, has rejected a proposal by the cooperative for joint use of poles for a transmission line connecting the Columbia Metals Co.'s fertilizer plant with the downtown area. Reasons for the refusal was said to be the failure of Salem Electric to live up to previous pole agreements.

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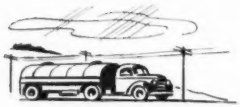

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## BPA REPORT FORECASTS POWER REQUIREMENTS

Regional requirements for electrical energy in the Pacific Northwest will increase from 4,354,000 kw. in 1948-49 to 8,116,000 kw. in 1957, Paul J. Raver, Bonneville Power administrator, forecasts in his annual report to the Secretary of the Interior.

This forecast of potential requirements makes no provision for additional power to aluminum plants, although the three primary aluminum manufacturing concerns in the area have announced they would expand if power could be made available. Bonneville has taken the position that allocation of more power to the aluminum industry should be a national decision because of national defense needs.

Dr. Raver predicted that the present power shortage may extend through the next seven years. The shortage was attributed to two causes—continued growth of population and industry in the area, and failure of the federal government to provide funds for power development commensurate with this regional growth.

Critical power shortages may occur any year until the McNary Dam begins operation, it is indicated. The most critical year in prospect under minimum hydro conditions, is said to be 1951-52 when the shortage may amount to 19% of regional requirements and 32% of potential requirements.

All-time peaks in power revenues, energy delivery and transmission capacity were reached in the fiscal year of 1948, Dr. Raver reported. All contractual commitments to publicly owned distributors and industry were met. During the year the Bonneville administration supplied 3,000,000,000 kwh. of energy to private utilities in Oregon, Washington and northern Idaho, 1,300,000,000 kwh. in excess of contractual commitments and a total of 39% of their total requirements, he reported. Operating revenue from power sales to 88 wholesale customers was approximately $25,000,000.

The report said that in the last fiscal year the two government-owned dams, Bonneville and Grand Coulee, produced 51.7% of the Northwest's kilowatt production. Other producers were: Montana Power Co., 12.3%; Puget Sound Power & Light Co., 12.3%; Washington Water Power Co., 6.2%; Seattle municipal, 5.2%; Idaho Power Co., 4.3%; Tacoma municipal, 3.8%; Utah Power Co., 4.3% Portland General Electric Co., 2.8%, and Pacific Power & Light Co., 2.8%.

Three primary needs for business-like operation of the Bonneville system are cited in the report: A well-planned river development program for immediate and long-range federal capital investment, a sustained and adequate financing plan, and authority for use of revenues for operation and maintenance.

## Arizona's Power Demand Estimated in Survey

Arizona's power demand, which already has surpassed supply, will call for between $2\frac{1}{4}$ to $2\frac{1}{2}$ billion kwh. by 1952, according to M. J. Dougherty, chairman of the Arizona Power Authority.

Based on surveys made by the authority, 1,500,000,000 kwh. will be available by that time from Colorado River projects. The state's share of Hoover energy in 1952 will be approximately 666,000,000 kwh., with about 450,000,000 drawn from Davis Dam and 300,000,000 from Parker Dam.

This will leave a deficit of 750,000,000 to 1,000,000,000 kwh. shortage for Arizona that will have to be supplied from hydro and fuel generation within the state and purchases from southern California utilities which have been supplying a portion of Arizona consumption for the past two years.

K. S. Wingfield, power authority engineer, said bids will be called soon on two 82,500-kw. generators to be installed at Hoover Dam to provide a portion of the Colorado-generated power.

A total of $13,000,000 is earmarked for Hoover Dam installations. Included is an estimated $9,250,000 for generating equipment and $3,750,000 for a switchyard.

Forewarning of an increase in the cost of power, Wingfield pointed out that where two generators at Hoover Dam will cost $9,250,000, the cost for installing four identical units for the city of Los Angeles before the war was $7,100,000.

Since installations must be paid back over a 50-year period, the rising costs in material and labor will be felt by the power consumer, he predicted.

Electrical requirements of the state have increased more than 30% since the end of World War II and consumption increased 18.35% between 1946 and 1947, M. M. McIntire, Bureau of Reclamation engineering staff, reports.

In 1947 nearly 2,000,000,000 kwh. of energy was used in the state, excluding mine loads and generation. Another 25% increase is predicted by the Federal Power Commission between 1947 and 1952.

McIntire reports Arizona can weather its present shortage if equal amounts of power remain available from outside the state during the next three years.

Chief source of additional power for Arizona will be the proposed Bridge Canyon project. This will have a rated capacity of about 4,675,000,000 kwh. of which the Central Arizona project will take 1,402,000,000 for transporting water through irrigation lifts. The remainder will be divided between Arizona, California, Nevada.

Pending development of additional river power, private utilities are pushing expansion projects.

Central Arizona Light & Power Co. has added a total of 30,000 kw. since the end of the war and will have another 11,500-kw. unit in operation by July. A 60,000-kw. expansion peak is expected by 1950. Expansion and modernization costs in 1949 will amount to more than $10,000,000 according to Henry Sargent, company president.

Arizona Edison will spend $1,750,000 in electrical expansion in 1949, according to Reid Gardner, president. The company has added 4,445 kw. since the end of the war with major expansions totaling 7,600 kw. planned in 1949 at Yuma, Maricopa, Casa Grande, Douglas and Miami-Globe.

In northern Arizona, power plants at Flagstaff and McNary operations of Southwest Lumber Mills Inc. and the Saginaw and Manistee Lumber Co., at Flagstaff will produce more than 5,000,000 kwh. of electricity each year above the mills' own requirements, according to James G. McNary, president of Southwest Mills.

The surplus is being distributed through local utility companies. Sawmill waste is used to operate the steam generators with an estimated 400 kwh. generated for each 1,000 ft. of lumber cut in the mills, McNary said.

● Maui (T.H.) Electric Co. has received authorization to increase its capital $750,000 to install a power plant and generator at Kahului, Maui, T.H. Besides the generator, the company contemplates other related transmission and distribution system improvements. Another Hawaii electric company, Kapaa Electric, on the island of Kauai, has received authorization to increase its capital by $60,000 to install a new generator.

● Bonneville Power Administration has awarded a $727,500 contract to General Electric Co. for construction of three automatic force-cooled transformers for the Goshen, Ore., substation, which will be one of the principal terminals serving southern Oregon with Bonneville power. The transformer bank will have a potential capacity of 250,000 kva.

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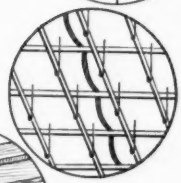

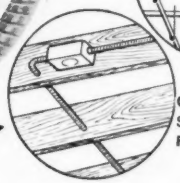

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## GROUPS WILL STUDY ROGUE DEVELOPMENT

Investigations leading to development of the Rogue River Basin in Oregon will be conducted by USBR, the National Park Service, Fish and Wildlife Service in collaboration with local and state interests, according to R. J. Newell, USBR regional director.

Newell said that the bureau would proceed immediately with preparation of an interim Rogue River Basin report, based on the best over-all plan of development with consideration of alternatives. As a result of earlier planning, the bureau had proposed the irrigation of 73,000 acres of new land, provision of supplemental water supply for 40,000 acres, and installation of about 100,000 kw. of new hydroelectric power capacity. Flood control also is planned.

The studies will seek to reconcile conflicting interests to the maximum extent consistent with a development of the basin which is physically and economically sound, Newell said.

## Frontier Power Rushes Expansion Program

An expansion program being rushed by Frontier Power Co. at Walsenburg, Colo., is expected to enlarge and modernize facilities. The entire job, according to the local manager, H. T. Dabney, will represent a $300,000 investment for a new high-pressure boiler and increased turbine capacity.

Stearns-Roger Mfg. Co. of Denver has been awarded the contract to furnish and install the equipment.

To keep pace with the improved generating capacity, Dabney said, the city's distribution system will require $33,000 for extensions, modernization and other improvements.

## Bridge River Installation Delayed by Bad Weather

B. C. Electric officials have announced that the second 62,000-hp unit scheduled to go into operation at its Bridge River project in February would be delayed "some weeks," because of bad weather and equipment delays. Completion now is expected in April.

J. H. Steede, executive assistant to the chief engineer, said that "every effort has been and is being made to speed up delivery of equipment, but shortages in some lines and winter weather will prevent it being completed for some weeks."

Structural steel being produced in Vancouver for the second unit is six weeks behind schedule and transformers from eastern Canada are two months behind schedule.

● Office of International Trade, Department of Commerce, has issued a booklet giving electrical current characteristics in more than 1,600 cities and towns of the world. It is in two parts, the first showing type of electrical power furnished by utility plants in each community and the phase, cycle and voltages for lighting and for household or small appliances; the second part containing information on predominating frequencies and voltages in the various countries with an indication as to which voltage and frequency preferred. Copies of *World Electrical Current Characteristics* are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price 15c per copy.

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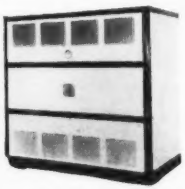

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## ALCO ALSO STUDYING B. C. OPERATION

Announcement has been made that a third aluminum company is interested in the development of hydroelectric power in British Columbia. Engineers for the Aluminum Co. of America, are now making surveys of the water reserves in the far northern section of British Columbia.

The company would like to build its aluminum reduction plant at Skagway on the American side of the Alaska border and use British Columbia power for its operations.

The two other firms, Aluminum Co. of Canada, and Reynolds Metal Co., which have announced studies for plants on the coast, have indicated that they would be completely British Columbia operations. Both would use power from the coast's huge watershed, and both would build their reduction plants and townsites on B. C. territory.

Alcoa, however, has been eyeing the huge reservoir of waterpower in the Atlin Lake district, which, it is estimated, would provide one of the largest and most economical sources of electric potential on the continent. The only way this power could be diverted to the sea would be through U. S. territory, which might cause international complications.

Use of British Columbia power, probably in excess of 1,500,000 hp., to supply a plant and industries at or near the Alaskan city of Skagway, could be politically embarrassing to the province. The huge watershed surrounding Atlin Lake presently drains northward into the Yukon, thence to Bering Sea. A few strategic dams and diversions could switch much of this water around to be utilized to manufacture aluminum, even though the plant is in U. S. territory. Alcoa has given the project considerable but secret study.

Engineers have estimated that power from this watershed would be well over 1,000,000 hp., and could possibly climb to nearly two million, if utilized completely.

● GROUND was broken last month for Pacific Gas and Electric Co.'s new 402,000-hp., Contra Costa steam plant on the San Joaquin River, two miles east of Antioch, Calif. The plant will be one of the largest on the company system and is scheduled for completion during the summer of 1951. It will cost about $51,500,000.

● THE OREGON LEGISLATURE has enacted a law authorizing the filing of liens against property of public utilities for unpaid taxes.


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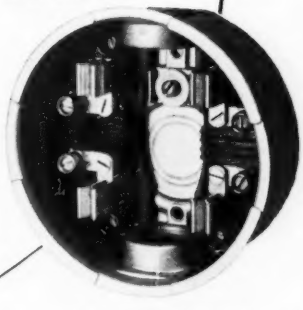

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● This new four-terminal standardized socket, Type R-1, covers with one catalog item the widest practicable range of applications and ratings for single-phase metering. It reduces the number of items to be stocked, increases interchangeability, and provides for future growth.

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## ARIZONA LEGISLATURE MAY GRANT RATE SURVEY FUNDS

The Arizona Legislature is considering a bill which would provide the state corporation commission with funds to make surveys of the capital structures of electric, gas, telephone and water utilities for rate making purposes. The bill's introduction signaled the reopening of a battle that waged through one regular and two special sessions of previous legislatures.

Under the proposal, the corporation commission would be able to use the special utilities tax fund without restrictions of the state financial code and the money would be continuously available for setting up and operating a utilities division.

Opponents of the proposition contend that, under the formula for a corporation-commission survey, power rates in Arizona can go nowhere but up. They insist, instead, on an equitable survey by FPC. Attempts to bring FPC experts into the state for that purpose have met with corporation commission opposition, however.

The new rate survey bill was introduced in the house by Clarence L. Carpenter of Gila County and John R. Franks of Yavapai County. It immediately brought protest headed by Sam J. Head, Yavapai County, who led the fight against similar propositions in 1947 and 1948.

Head contended that such a rate survey would increase power costs and retard industrial development in Arizona for 25 years. "The bill," he said, "would permit the corporation commission to use $91,380.90 already accumulated in the special utilities tax fund to make a survey of the capital structure of power companies and other utilities on any basis it wishes."

Contending that the proposed basis for the survey was "all in favor of the utilities," Head noted that "under the measure the commission may use and has indicated it will use the principal of inventory replacement value. That is the cost of reproduction, less depreciation, plus plant additions. At the present high cost of construction, that means simply that the corporation commisison may set a tremendously high value on utility holdings for rate making purposes, fix the rates on those high values, and make the people of Arizona pay the bill."

Head argued that the utilities are entitled to an appraisement survey made on actual dollars invested in additions to plants, but are not entitled to a survey on what it would cost to replace the entire plant at today's prices.

● FPC has denied Montana Power Co.'s application for rehearing of a commission order requiring the company to file a license application for nine developments on the Missouri and Madison rivers in Montana.

● California Electric Power Co. has filed with FPC for authorization to issue $3,000,000 principal amount of 3% first mortgage bonds and $2,000,000 in 5½% convertible preference stock.

## Institute for Electric Metermen Held at UC

An Institute for electric metermen was held at the University of California during the week of Jan. 31 to Feb. 4, 1949. It was attended by 45 metermen from 12 private and municipal utilities in California, Oregon and Nevada. Lectures on subjects pertinent to meters and metering were given by university instructors, utility engineers, and manufacturing engineers. All reports indicated enthusiastic acceptance by those who attended.

The course was conducted by Prof. T. C. McFarland, chairman of the Division of Electrical Engineering at the university, under the auspices of the Extension Division and in cooperation with the meter group of the Pacific Coast Electrical Assn.

## Supreme Court Gives Priority to Tax Claims

The Supreme Court has ruled that U. S. tax claims have priority over claims of unpaid employees in cases of bankrupt companies. The unanimous ruling reversed a decision of the Ninth Circuit Court of Appeals in California, which had ruled for the unpaid workers of the Kessco Engineering Corp. of Los Angeles.

The collector of Internal Revenue seized the firm for unpaid taxes in 1946. Its assets were sold at auction, leaving in the hands of the collector's trustee $31,200. Claims against the firm included $40,922 in federal taxes, $3,324 in wage claims, and $15,135 in taxes due to the California department of employment.

The court's ruling affirmed the doctrine that federal claims have priority over all other claims on a bankrupt estate.

● George H. Flagg, Oregon PUC commissioner, has suspended the rate schedules filed recently by Portland General Electric Co. and Pacific Power & Light Co. providing increased rates on their Oregon operations. Public hearings on the applications will be held.

## BPA, CONTRACTORS DISCUSS CONTRACT JOBS

Contractors interested in line construction, both electrical and general, met with the Bonneville Power Administration chief engineer, S. E. Schultz, and D. L. Marlett, assistant administrator, and staff members, at Hotel Multnomah, Portland, Feb. 15, to discuss mutual viewpoints respecting awarding of contracts for pole and transmission line construction. BPA presented its problem as one of getting the lines built and operating as quickly as possible, explaining what it felt was necessary to be done by force account with its own crews, and received suggestions from the contractors as to how best to handle contract jobs.

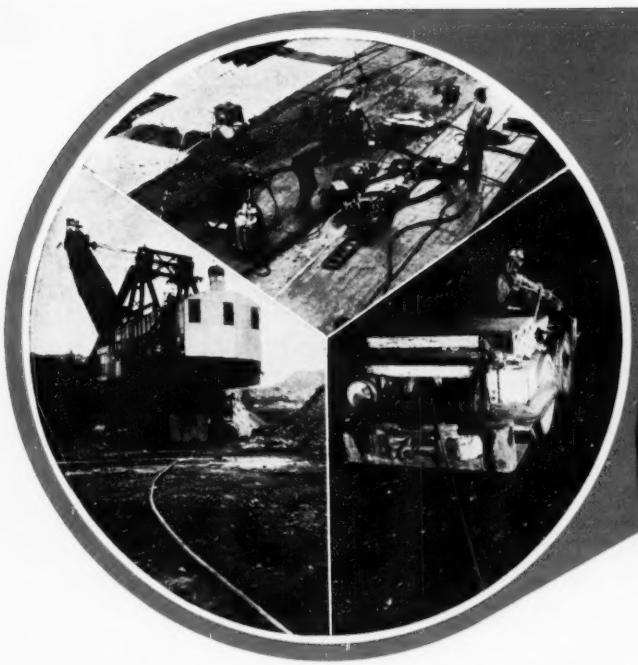
Force account work will be kept to a minimum, possibly less than 10% of the $16,000,000, and will be on jobs requiring technical skills, substations, "hot stuff," rush jobs, and where lack of outside bids make it desirable to keep control over bid prices. BPA was willing to break projects into smaller sections to permit smaller operators to contract jobs not too big for their capacity and capital. Questions of furnishing the materials, specifications, schedules, etc., were also discussed and the contractors asked to form a committee to receive suggestions and questions from all interested parties. This committee would present these questions to BPA and decisions reached would then be passed on to all interested.

The Northwest Line Constructors section of National Electrical Contractors Assn. was represented at the meeting by R. B. Lane, its chairman, and Paul Hayden, its secretary and by E. R. Cornish, NECA field representative, San Francisco.

● A Licence Tax on electric utilities amounting to approximately 3% on gross earnings within the city has been passed by the Salem, Ore., city council. It applies to Portland General Electric Co. and the Salem Electric, a cooperative.

● Utah Power & Light Co. is now offering its hospitalization program for employees after their retirement. Provision may also be made by retired employees for hospitalization for their dependents.

● Pacific Gas and Electric Co. has adopted a group life insurance plan for its employees. The program is on a cooperative basis with the company and subscribing employees sharing the cost.



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These are the features that have paid off in long-lasting, trouble-free service wherever TIREX Cables have been called upon to serve portable electric equipment. Whatever your requirements, there are TIREX Cables to meet them, with the same benefit to you. We will be glad to help you select those best suited to your needs.

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# NEWS ABOUT PEOPLE

● At a Meeting of the board of directors of Central Arizona Light & Power Co., George H. Groh was elected vice-president in charge of operations, and John T. Kimball was elected vice-president. Groh has served as chief engineer and general superintendent of the utility since 1945. Kimball joined the organization in 1946 as manager of research and development. According to Henry B. Sargent, president of the company, both men will continue with essentially the same duties. They were made officers of the company in recognition of their records and added responsibilities in the expanding operation of the utility.

● Southern California Edison announced personnel changes: Harold L. Moore, Pomona district manager, was transferred to the general office as manager of the right of way department; F. W. Nelson, Fullerton district manager, was made Pomona district manager, and C. E. Demarest, assistant district manager, Long Beach, became Fullerton district manager.

● D. B. Leonard has been appointed assistant general manager of Pacific Power & Light Co., in charge of the utility's Oregon operations. He succeeds Charles M. Sanford, who will act temporarily in a consulting capacity to the president, vice-president and general manager, pending his retirement from active service. Leonard has been with the company since 1929.

● Raymond W. Clifford, attorney of Olympia, Wash., has been appointed director of the Washington State Department of Public Utilities by the new governor. He succeeds Andrew Zimmerman, who held the post under the retiring governor.

● Philip S Griffin, who will represent Electrical West from the Chicago office, has been occupied in industrial publishing for the utility industry since his graduation from Northwestern University in 1937. Most recently he has been assistant publisher of the two utility sponsored magazines—*Electrified Industry* and *Today's Business*. Utility and industrial engineers know him best as editor of the former magazine. Under his editorship the magazine worked closely with the utilities to give industry its first picture stories of a number of important electrical developments. The list includes

GRIFFIN

stored energy and three-phase resistance welding, dielectric and induction heating, the electronic frequency changer and many other power distribution innovations, electronic motor control, automatic isothermal heat treating, automatic monorail carriers and electrostatic paint spraying and detearing. For the latter magazine Mr. Griffin was active in the store modernization programs of both the utilities and the equipment manufacturers, particularly in the fields of lighting and air conditioning.

● West Coast regional committee chairmen of the Third International Lighting Exposition, to be held March 29 through April 1 in Chicago, have been announced. They are G. A. Hochenauer, Benjamin Electric Mfg. Co., Los Angeles; R. C. English, Miller Co., Portland; William Benndorf, Smithcraft Lighting Division, Phoenix; F. J. Wellhouse, Westinghouse Electric Corp., San Francisco; W. K. Turner, Curtis Lighting Inc., Seattle; R. A. Potter, Westinghouse Electric Corp., Salt Lake City.

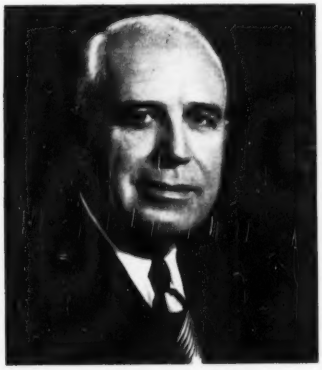
● R. J. "Doc" Wiseman, chief engineer of the Okonite Co., suffered a coronary occlusion last month while enroute to the Pacific Coast for one of his periodic visits. It will be several months before he travels again.

● William F. Snyder, district superintendent of service and erection of the Allis-Chalmers San Francisco office since 1924, retired recently after 40 years of service with the company.

● W. R. Windfield has been promoted to district operating manager of Graybar Electric Co. at Seattle.

## Deaths

● RALPH R. WALBRIDGE, vice-president of Southern California Edison Co. in Los Angeles, was killed Feb. 16, when his car overturned after striking a soft shoulder. Born in Santa Ana, Mr. Walbridge joined the Edison organization in 1911 and has since served the company in various capacities in Los Angeles, Santa Ana, the San Joaquin Valley, Santa Barbara, Pasadena and Alhambra. Following assignments as district and division manager in most of these districts, he was appointed commercial manager for the company in 1939 and was elected vice-president in 1945. Mr. Walbridge gave much of his time to civic development and community affairs. He was a director of the Pacific Coast Electrical Assn. and a member of the Los Angeles Electric Club.



Ralph R. Walbridge

● WILLIAM L. HOFFMAN, 73, electrical engineer of Seattle, Wash., died there Feb. 7. Born in Chippewa Falls, Wis., Mr. Hoffman moved to Tacoma in 1903 and was on the engineering staff which built the city of Tacoma's Nisqually power plant. After working for a time with the Stone & Webster Engineering Corp. on construction of the Northwestern Electric Co.'s Condit plant, he joined the Puget Sound Power & Light Co. in Seattle in 1914 and continued with them until his retirement in 1945. He was a member of the American Institute of Electrical Engineers.

● I. B. STURGES, electrical inspector for the city of Portland who had charge of its control over the sale of substandard electrical appliances, and who was a past president of the Northwestern Section, IAEI, died of a heart attack in December. He had been in the electrical department for over 25 years.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FOR SAFE, DEPENDABLE PERFORMANCE

1. Spring hinged, gasketed cover closes receptacle when not in use.
2. Plated steel housings fully protect the contacts.
3. Adjustable Cord Grips eliminate strain on connections.
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# NOTES ON THE TRADE

● WESTINGHOUSE ELECTRIC SUPPLY Co., Los Angeles, has announced the following changes: M. B. Sauer, formerly district radio manager, has been named manager of the new Vernon branch. G. I. Hicks has been appointed district apparatus and supply manager. W. A. Matzinger will be district lamp and lighting manager. W. W. Bell has been named metropolitan appliance manager, and C. J. Bledsoe appointed multiple housing appliance sales supervisor. Ray Robinson will be district specialties sales manager, and George Pegg has received the appointment of personnel supervisor.

● EFFECTIVE Jan. 1 the following personnel changes were made in the Frigidaire district organization: R. E. Robertson, manager of the Oakland branch, was transferred to the Pacific region as assistant to the regional manager. H. J. Miller, manager of the Oklahoma City branch, assumed duties as manager of the Oakland branch.

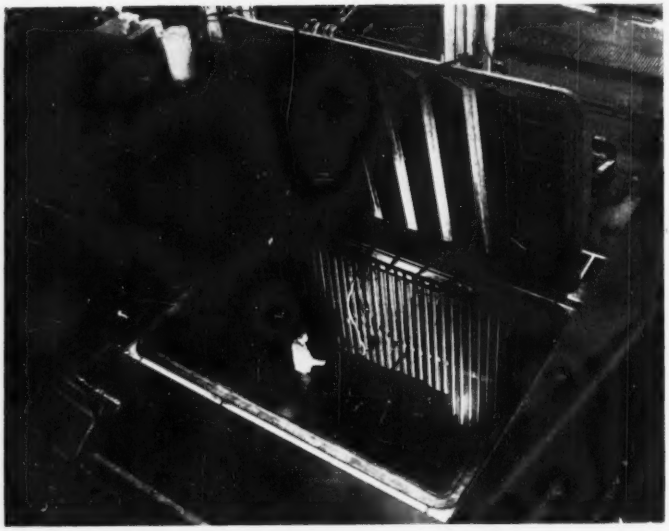
● APPOINTMENT of M. H. Freedman as division manager of the Pacific Northwest division of Columbia Steel Co. was announced recently. At the same time it was reported that C. C. Johns will be manager of sales at Portland, and Ralph Winship will be manager of sales at Seattle.

● EDWARD P. ATCHERLEY has assumed duties as Northwest division manager of renewal tube sales for Sylvania Electric Products Inc. His territory includes Montana, Idaho, Oregon and Washington. Atcherley will headquarter in Seattle.

● WARD LEONARD ELECTRIC Co., Mount Vernon, N. Y., has established a Los Angeles branch office and warehouse, located at 420 S. San Pedro St. District manager is H. S. Eales, with E. R. Slivinsky assisting.

● ALUMINUM Co. of AMERICA has let contracts for grading the site of its new aluminum rod, wire and electric transmission cable plant to be built adjacent to its reduction plant in Vancouver, Wash.

● A 75-TON ELECTRIC FURNACE will be added to the steel making facilities of Bethlehem Pacific Coast Steel Corp.'s Los Angeles plant, the company announced. A 50-ton electric furnace was put into operation at the Los Angeles plant more than a year ago. The new 75-ton furnace will increase the steel making capacity of that plant to approximately three times its output capacity at the end of the war.



Taken from the top of a crane beam, this photo shows a vacuum tank used to process large electrical equipment at the Westinghouse Sunnyvale, Calif., plant. This 15 x 10 x 16-ft.—3½-ton tank is used for impregnating electrical apparatus with special transformer oil in an approximately 98% complete vacuum

● L. A. HOBBS, vice-president and sales manager of Smoot-Holman Co., Inglewood, Calif., who recently returned from a meeting of the National Security Resource Board, has been appointed vice-chairman of the task committee to cover the Western area for the electrical lighting fixtures industry.

● ALBERT W. TRACY, who has been associated with Anaconda Wire and Cable Co. since 1929, serving most recently as district manager at San Francisco, has taken over the Rocky Mountain territory as district manager, with headquarters in Denver.

● DONALD UMPHREY has been named chief engineer of the Pacific Electric Mfg. Corp., San Francisco. He was formerly head of the development engineering department. In his new capacity Umphrey has general supervision over the company's departments of research and development, circuit-breaker engineering, air-switch engineering and testing. A graduate of Oregon State College, Umphrey for six years was an engineer for the Eugene, Ore., Water Board. For seven years prior to joining Pacific Electric, he was in central station engineering work for an electrical manufacturer as a specialist in system planning, relaying, and circuit-breaker application. Numerous significant design improvements in this field are credited to Umphrey including an interruptor that enabled the Pacific oil circuit breaker, in a recent test, to interrupt 9,600,000 kva. at 230 kv. on a 3-phase basis.

● TRI-STATE SUPPLY Corp. has purchased an additional 9,000 sq. ft. of land adjoining its Los Angeles property, located at 544 South San Pedro St., which will be used for customer parking space to facilitate pickup and delivery service.

● COLUMBIA STEEL Co. has announced the appointment of Perry Kilsby Inc., Los Angeles, as distributor for Shelby seamless tubing manufactured by National Tube Co. and marketed by Columbia Steel on the Pacific Coast.

● SMOOT-HOLMAN Co., Inglewood, Calif., has appointed Merle A. Potter to the post of director of distributor relations in the Los Angeles area. He was formerly assistant manager of the Standard Wholesale Electric Co., Los Angeles.

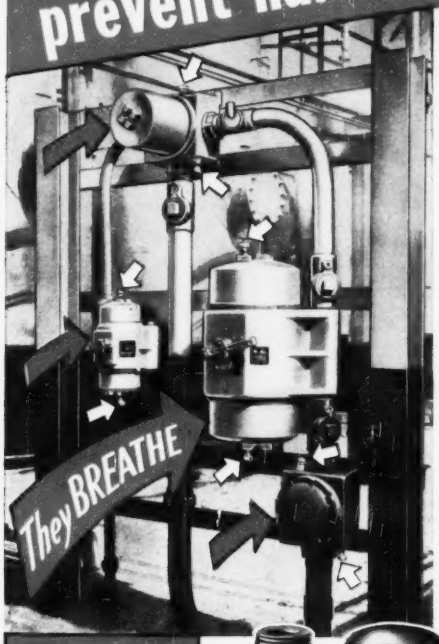
● ELECTRICAL SPECIALTY Co. has taken over the sale of Gardner transformers, both air cooled and oil cooled, in Colorado, New Mexico, Wyoming, Utah, most of Idaho, most of Montana and eastern Nevada.

# CROUSE-HINDS Breathers

## prevent harmful water condensation

in explosion-proof electrical conduit systems

## under humid conditions




- **FORESTALL** the formation of destructive mildew by ventilating enclosures.
- **EXTEND the LIFE** of insulation and equipment under adverse conditions.
- **MINIMIZE** the danger of expensive shut-downs due to insulation or equipment failure.

Paragraph 5015-C5 of the 1947 National Electrical Code states that *"where there is a possibility that water or other condensed vapor may be trapped at any point in the raceway system, approved means shall be provided to prevent accumulation, or to permit periodic draining of such water or condensed vapor"*

Explosion-proof electrical enclosures cannot be vented in any of the usual ways because they must be kept flame-tight. Crouse-Hinds' explosion-proof Type ECD Breathers, Type ECD Drains, and Type EZD Drain Sealing Condulets meet the Code requirements and are listed by Underwriters Laboratories for such service.

The Brecthers are similar to the Drains but have metal hoods which make them water and dust shedding. Both have corrosion-resisting bodies with internal flame-tight (but not airtight or watertight) labyrinths. They can be used freely without impairing the explosion-proof integrity of a conduit system, providing they are always installed in a Condulet hub or other opening *with five or more full threads engaged.*

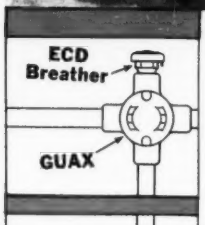
In humid atmospheres, water condensation occurs in explosion-proof systems, especially where temperature changes are frequent. Accumulation of water in harmful quantities is common. Mildew, a bacterial growth, is often present. It attacks many insulations and will destroy them unless the cause is removed. In such humid atmospheres troubles of this nature can be avoided by the proper installation of Crouse-Hinds' Breathers and Drains in conjunction with explosion-proof Condulets*.

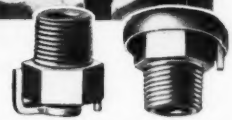
Breathers should be placed at the highest points and Drains at the lowest points of all housings and conduit runs. Heat generated by the current flowing through conductors and electrical devices raises the temperature of air within the conduit and housings. Breathers and Drains permit the resultant upward passage of the warmed air to remove moisture and thoroughly ventilate the enclosures. This prevents the accumulation of water and removes moisture that may have collected under unusual conditions.

This method is successfully used in many of the largest plants in the chemical and petroleum industries. Several years of field experience has demonstrated that the moisture is either entirely removed by ventilation, or so reduced that it is not harmful.

These devices have also been successfully used in non-hazardous locations where condensation is troublesome.

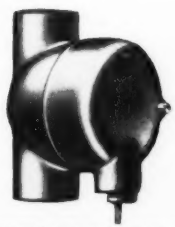
If you have a condensation problem, Crouse-Hinds Company will gladly assist in solving it. Write to



Type ECD Drain — Type ECD Breather

**CONDULETS with Crouse-Hinds Breathers and Drains can be installed for ventilation throughout an entire explosion-proof conduit system**



**Type EZD Explosion-Proof Drain Sealing Condulet**

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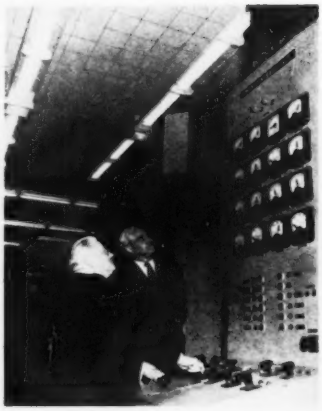


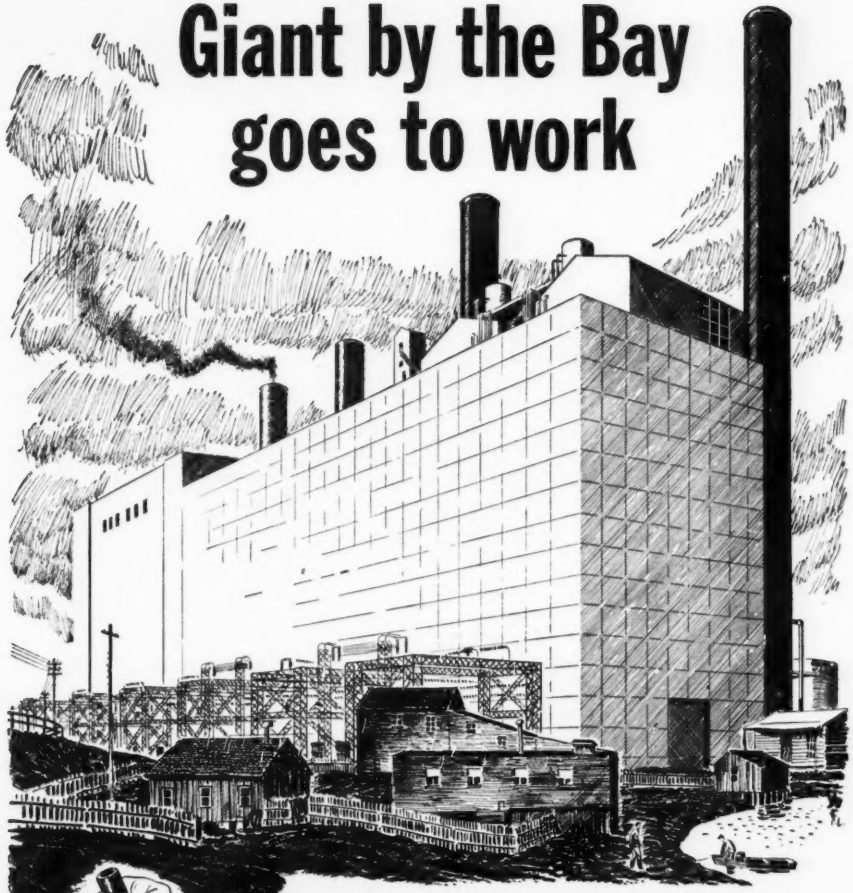
Mayor Robinson of San Francisco officially puts on the line station P, Pacific Gas and Electric Co.'s new 222,000-kv. Hunter's Point steam plant, as James B. Black, president, PG and E, looks on. New plant was dedicated Feb. 8, 1949, with fitting ceremony with PG and E host to more than a hundred special guests including press

W. N. Johnson and L. F. Hunt of Southern California Edison Co. (above right), two of the Westerners at the recent winter meeting of the American Institute of Electrical Engineers in New York

Donald Umphrey (right) recently named chief engineer of the Pacific Electric Mfg. Corp. of San Francisco. He was formerly head of the development engineering department of that company

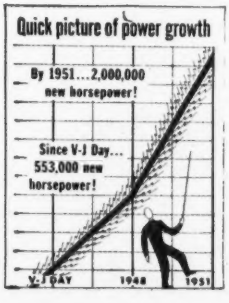
Most of the officers of San Francisco Electrical Contractors Assn. on the day of their re-election. Front row, left to right, Ed Dowd, treasurer; Wes B. Baker, president; Roy Crookes, vice-president; Ed Scott, secretary; rear row, H. C. Reid, William Kennedy, directors; W. J. Varley, manager; Pat Furlong, William Schultz, directors. Others absent were Roy Moser, Ken Ryals and Fay Lemoge

# Giant by the Bay goes to work



## Expanded power plant now pouring 360,000 electrical horsepower into P. G. and E. lines

**Now mightiest** of all P. G. and E. powerhouses is expanded Station "P" near Hunters Point on San Francisco Bay. Last week, its second new generator went on the line to step up total output to 360,000 horsepower. That's enough energy to supply the cities of Oakland, Stockton, Tracy, Berkeley and San Jose.

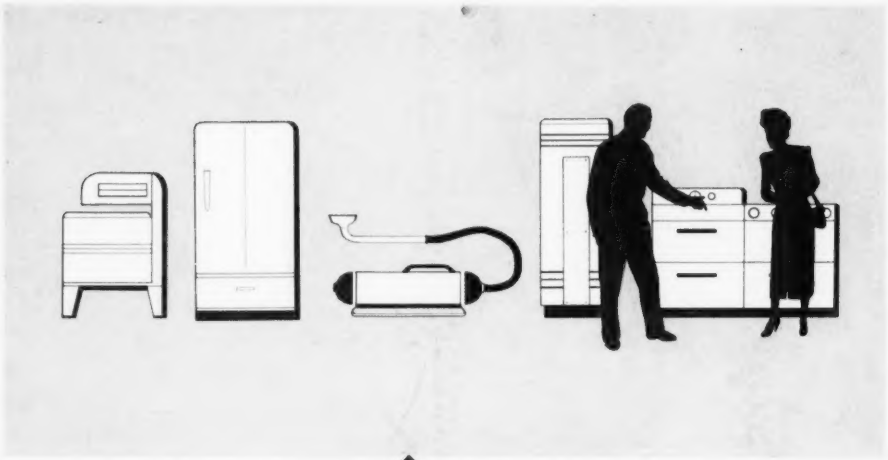


**1,519 men**— 23 crafts and trades worked on the Station "P" expansion. This is just one example of how P. G. and E.'s power-building program creates employment.

**New post-war homes,** farms and factories in the area are being served fully. Last year alone, for example, 60,000 new service connections were made in Northern and Central California.

P · G · and E · PACIFIC GAS AND ELECTRIC COMPANY

EW 103-349



*a prop* **ADEQUATE WIRING** *for your profit line!*

It takes more than a series of first sales to make a profit line. Steady customers, who think of your store when they think of additional appliances, are essential for good business. And that is where adequate wiring comes in.

Figure it this way: When Mrs. Buyer plugs in her appliance at home, it has to live up to your sales talk. It will, too, with Adequate Wiring to help. With plenty of circuits, outlets and switches, she'll get maximum convenience and perfect performance, and Mrs. Buyer will become Mrs. Regular Customer.

So put Adequate Wiring down as one of your best selling aids, and encourage its installation at every opportunity. It turns first sales into second sales — and then into regular repeat sales.

**PACIFIC COAST ELECTRICAL ASSOCIATION**

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